DOCUMENT RESUME

ED 257 083 CS 208 905

AUTHOR	Chew, Charles R., Ed.
TITLE	Computers in the English Program: Promises and Pitfalls. New York State English Council Monograph.
INSTITUTION	New York State English Council.
REPORT NO	ISBN-0-930348-11-7
PUB DATE	84
NOTE	153p.; The New York State English Council is an affiliate of the National Council of Teachers of English.
AVAILABLE FROM	National Council of Teachers of English, 1111 Kenyon Rd., Urbana, IL 61801 (Stock No. 08202, $6.00 member, $6.50 nonmember).
PUB TYPE	Guides - Non-Classroom Use (055)
EDRS PRICE	MF01/PC07 Plus Postage.
DESCRIPTORS	*Computer Assisted Instruction; *Computer Software; *English Curriculum; Higher Education; *Microcomputers; Personal Narratives; Secondary Education; *Word Processing; *Writing Instruction; Writing Processes
IDENTIFIERS	Software Evaluation

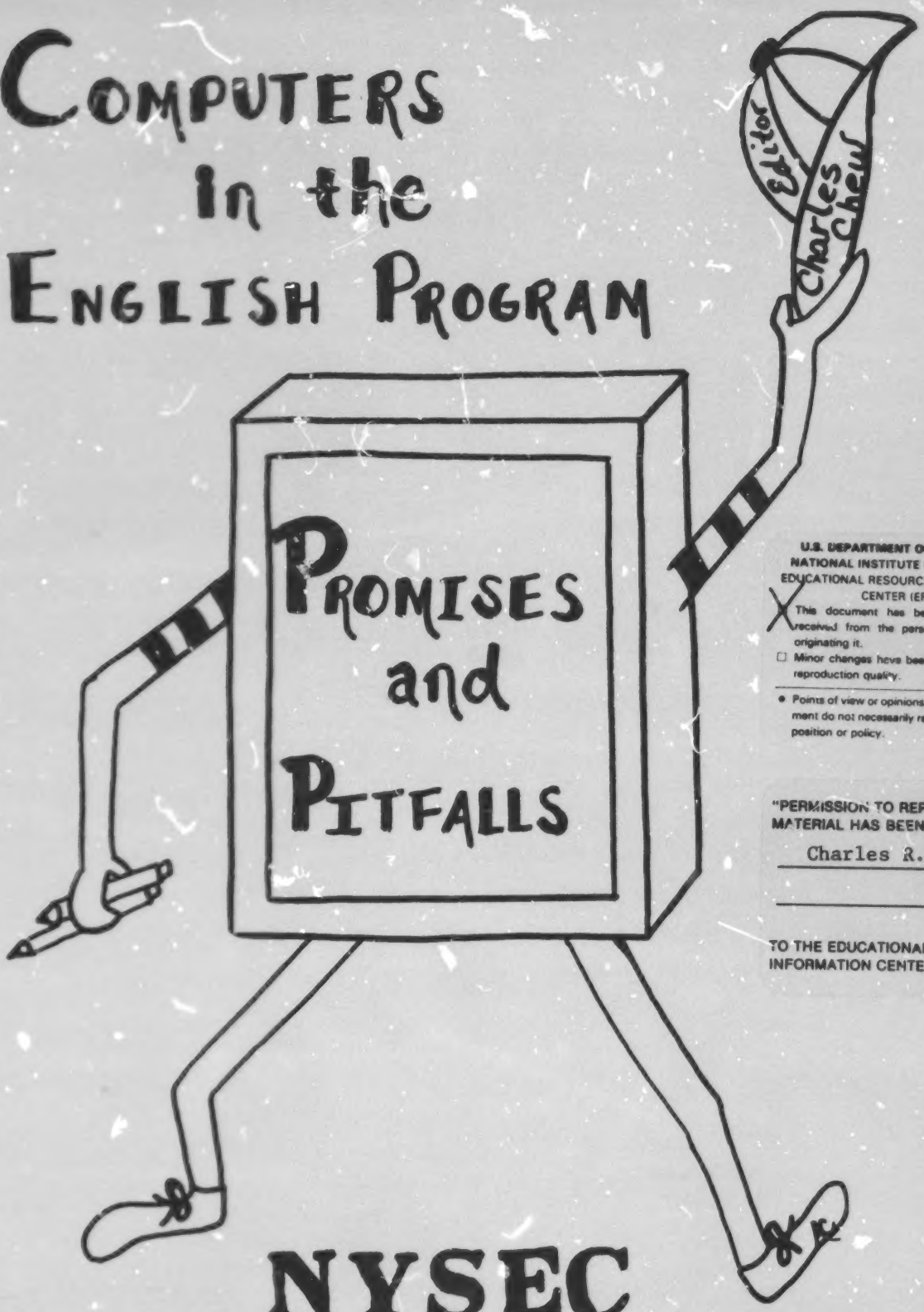
ABSTRACT

Since an increasing number of English teachers are being asked to find a place for computers in the English program, this monograph focuses on issues connected to this technology. The first article sets the stage with a discussion of the power and potential of the computer. Other articles focus on the following topics: (1) promises and shortcomings of computer technology, (2) a districtwide planning approach to computer use, (3) computers and the writing process, (4) the development of a computer writing program to meet the needs of students with some special needs, (5) the practical implications of the computer in an English program at the university level, (6) the "ins" and "outs" of software selection, (7) personal reactions to program reviewed by the authors, (8) advice to teachers who must make decisions about what to buy, and (9) personal accounts of two teachers and one student who became involved in computers--professionally and personally. (HOD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED257083

COMPUTERS in the ENGLISH PROGRAM



U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Charles R. Chew

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

NYSEC MONOGRAPH

CS 208 705

COMPUTERS IN THE ENGLISH PROGRAM: PROMISES AND PITFALLS

New York State English Council
1984

President
Grace Larkin

Executive Secretary
John Andola

Monograph Committee
Charles R. Cheves
Philip S. Morse
JoAnn Wallace
Linda Welles

Copyright © 1984 The New York State English Council

New York State English Council Monographs

Editor: Charles R. Chew

Monograph Committee: Philip S. Morse, JoAnn Wallace, Linda Welles

New York State English Council

Executive Secretary, John A. Andola, P.O. Box 2397, Liverpool, New York 13089

ISBN: 0-930348-11-7

TABLE OF CONTENTS

COMPUTERS IN THE ENGLISH PROGRAM: PROMISES AND PITFALLS

Using Computers in Teaching English 1
James Squire

Computers in the English Program: Promises and Pitfalls 7
Louise Matteoni

THE COMPUTER IN THE ENGLISH PROGRAM: DISTRICT-CLASSROOM-UNIVERSITY

Developing a K-12 District Computer Education Program – One District's Approach 19
Frank Ferris

Writing Essays in the Computer Lab 37
Tony Howarth

Paragraph-Prompt: A Computer Assisted Aid in the Teaching of Writing 45
Paul J. Helberg

Adapting the Writing Process to the Microcomputer 57
Joseph DeRoller, Dianne Hammar, Richard Stear

Computers in the English Curriculum 75
Ball State University – A History
Linda Meeker

SOFTWARE EVALUATION AND SELECTION

Computers in Education 89
Renée Levitt

The Bits and Bytes of Software Evaluation 95
Francis Zappone

Just Because the Bear Dances 103
Muriel Mandell

But I Don't Even Like Computers! 111
Jacqueline L. Marino

COMPUTER USES: PROFESSIONAL AND PERSONAL

Computers and English 121
Grace C. Walter

How Really to Use A Computer As Word Processor 124
Doris Quick

Computers and the Student: From Games to Writing 141
Timothy Chew

INTRODUCTION TO AUTHORS 147

INTRODUCTION

Now that the computer age has arrived, more and more English teachers are being asked to respond by finding a place for computers in the English program. This monograph, **Composition in the English Program: Promises and Pitfalls,** attempts to focus on a number of issues connected to this technology. The monograph serves as a forum for an exchange of ideas and practices. The publication does not present a monolithic picture of approaches to use or procedures to adopt.

James Squire sets the stage with a discussion of the power and potential of the computer. Regent Matteoni discusses how computers can be used, promises this technology gives, and the shortcomings which may not be readily apparent.

The next four articles focus on specifics of computer use in school districts, classrooms, and a university. Frank Ferris leads us through a district-wide planning approach to computer use; Tony Howarth and Paul Helberg in their articles show the boon computers are to the writing process. In "Adopting the Writing Process to the Microcomputer," Joseph DeRoller, Diane Hammer, and Richard Stear illustrate the development of a computer writing program to meet the needs of students with some special needs. Linda Meeker continues the discussion of the practical implications of the computer in an English program at the university level.

The third section of the monograph focuses on software with a discussion of the "ins" and "outs" of software selection and some personal reaction to programs reviewed by the authors. Jacqueline Marino, Francis Zappone, Muriel Mandell, and Renée Levitt give some sound advice to teachers who must make decisions about what to buy.

The final section gives personal accounts of two teachers and one student who became involved in computers – professionally and personally. Grace Walter gives an accounting of how she has made the computer serve her English Department; Doris Quick tells of her experience with the computer and word processing in her life as student and teacher; Timothy Chew describes his development as computer and word process user.

As you read these articles you will note that although written independently, a number of themes keep reoccurring – the potential of the computer and word processor cannot be underestimated, planning must precede integration of computers into the English program, programs can meet specific needs of teachers and students, criteria must be developed and used for software selection, and teachers will not be replaced by a machine.

Hopefully you will be able to use this information and all that is contained in the monograph as you plan your English program.

Charles R. Chew

ACKNOWLEDGMENTS

A special "thanks" needs to be given to Monograph Committee members, Phillip Morse, JoAnn Wallace, and Linda Welles. These three helped me to bring the publication to the printing stage by not only proof-reading the entire manuscript, but also by giving invaluable suggestions about revising and editing. All three completed this task at a very busy time of the year and without complaint. John Andola did most of the leg work to arrange printing and distribution. The efforts of these colleagues made my task an easier one.

A special note of appreciation is extended to my daughter, Adria, who designed and created the cover.

Charles R Clem

COMPUTERS IN THE ENGLISH PROGRAM

PROMISES AND PITFALLS

USING COMPUTERS IN TEACHING ENGLISH

James R. Squire

The computer is a tool for the mind and those who teach children and young people to use their minds will find that the computer provides an invaluable resource.

At its best the teaching of English focuses on the processes of the mind - on cognitive skills, on the process of composing, the process of comprehending, the process of responding to literature. The computer, more especially the word processor, demands cognitive processes and can help individuals become more systematic in their thinking. William Zinsser, for instance, has recently devoted a book to discussing the changes in writing made possible by use of word processors - ease in achieving unity, coherence, and emphasis; in eliminating clutter, in expanding and transforming sentences, in controlling decisions on diction and word choice. What the computer provides for Zinsser is refinement of strategies for effective writing that he earlier had to struggle to maintain. So may it be with all students.

The power that the computer provides a user is the power to manipulate symbols - verbal symbols through the processor, numerical or visual symbols with other types of programs. The ease with which word, sentence, or data transformation becomes possible through writing, editing, graphing, and transforming data to graphic display make such cognitive operations accessible to students of all ages. Thus John Henry Martin, in his experimental "Writing Into Reading" program, uses a combination of the word processor and typewriter to stimulate more writing among kindergarten and first grade children that can normally be found in many middle and upper grade classes.

We know that language learning is active and that a student vigorously engaged in using language is more likely to learn from his experiences than a student who is not engaged. Unlike television, the impact of the computer world on children and young people is active, even interactive. Engagement in symbol manipulation can lead with guidance to developing control over symbols. Computer simulation of reality can stretch across a continuum from direct verbal experience to vivid vicarious experiences, and young learners can profit from it all. As Seymour Papert points out in Mindstorms, children learn to think when they respond to and are responded to by a rich environment. The right kind of computer environment will stimulate thought, play, discussion, and learning with ideas of substance.

One basic change coming with the introduction of word processing into the English curriculum is increase in human interaction. Bertram Bruce, Senior Scientist at Bolt, Beranek, and co-developer of several software programs for writing, has commented repeatedly on the increased communication that results as students "mill around" the word processor waiting for their turn, as they read one another's writing on terminal and react to it, as they gain access through computer storage to previous writing and are led to make comparisons. A sense of audience, difficult to develop in classrooms under the best of circumstances, can be a result.

One reason why teachers of English have been slow to utilize the power of the word processor in teaching is their association of computers with mathematics, statistics, and testing, and an almost irrational association of computerization with thought control (the inheritance, I suppose, of films like 2001: A Space Odyssey). Computer-assisted instruction (CAI) too often has come to be associated with routinized drill, practice, and the electronic workbook; computer-managed instruction (CMI), with assessment which focuses on all that is superficial in language learning.

Neither CAI nor CMI need to be routinized, mechanistic, or superficial, of course, any more than manually directed learning activities. There is such a thing as intelligent drill and practice. But given the misunderstandings which have grown up around the terms, individuals will find utilization of more sensitive terminology to be helpful in discussing classroom opportunities.

The National Science Foundation's Task Force on Pre-College Mathematics and Science Instruction identifies three kinds of experience with computers important for students in our schools - learning about computers, learning through computers, and learning with computers. This framework is useful in reviewing possibilities in English.

Learning About Computers

Teaching computer programming to students may presently be the most widespread application of computer technology in our schools. Often provided in separate course offerings on "Computer Literacy" (recommended for a half year in A Nation at Risk and many of the current school reform proposals and soon to be tested by College Entrance Examination Board if not the Regents of New York State) such instruction focuses on teaching procedural thinking skills and competence in using computer languages. It seems right and proper to assign responsibility for teaching the ability to manipulate mathematical symbols to the teacher of mathematics. Hence, much of the instruction about computers is in mathematics. But think for a moment of the cruciality of verbal symbol manipulation in uses of computers. If competence in programming word processors and using text editors is an important dimension of learning about computers, should not the procedural education in the uses of language be directed by the specialists in language learning - either as units in the courses on computer science or as part of general English instruction?

Learning Through Computers

Measured by time expended and dollars spent, this mode of instruction has been the most widely discussed and is the focus of much of the software and courseware currently available. Drill-and-practice, diagnostic testing, individualized question-and-answer tutorials -- these are the familiar approaches. Most involve a one-to-one relationship between the student and the computer and little teacher intervention in learning.

Partially because much of the initial software available for this mode of instruction has been less than imaginatively conceived, partially because the conventional CAI/CMI approaches raise the spectre of computer control of curriculum, partially because the very nature of such an approach threatens to swamp schools and children with mechanistic rote learning of isolated subskills, teachers of English have been understandably reluctant to embrace such activity.

But learning through computers need be no more deadly than the individual teachers who control it. A computer-managed program of instruction will be no stronger than the manual system on which it is based and that, in turn, will vary in quality with the nature of instruction being managed. Confined to pedestrian subskills in language structure or to discrete, low level learnings in reading, computer based education will not focus on the critical processes of comprehending and composing. But with sound instruction, the mechanized system can save an enormous amount of teacher time, can provide periodic reports on student needs in language learning and make possible greater individualization, and can help teachers manage large groups of students more effectively.

Similarly, intelligent drill and practice can help teachers focus on important aspects of programs. Software is now available not only to help customize language instruction for individuals, but also to stimulate children to think

creatively about language - to interact imaginatively to sentences and paragraphs; to detect plot or non-narrative structure; to study inference; to develop sensitivity to the multiple uses of language.

Any thorough study of currently available options will identify many usable programs which can enhance important learning in English. If only ten to fifteen per cent of current software is of first rate quality - and most estimates fall into this range - the potential quality of the learning experiences provided by the best of the new usable programs is so astonishing that it should not be neglected.

Learning with Computers

The most promising mode for using the computer in learning is using it as a tool of instruction to create an environment in which classroom learning can occur. In this mode the computer becomes a resource to advance the thought processes of users. The learner controls the machine; not the machine, the learning. Word processing or text editing systems, for example, facilitate all aspects of learning the process of composing from drafting through editing and publishing.

Other possibilities being explored:

- Educational games which place the student in a simulated environment (an occupation, a crisis situation, an historical or geographic context) where he must make decisions and solve problems.
- Data bases which must be accessed through the computer to offer new resources for learning.
- Software packages that plot graphs of functions and structures to enable users to visualize more easily, say, the basic pattern of a story or the organizational structure of an expository selection.

With such tools students can engage in high order thinking and explore thought patterns not easily introduced in formal school instruction.

Exciting as are the long term possibilities, teachers of English must begin slowly. Providing a single word processor in every English class is within easy reach. Establishing a classroom corner of four or six for use by groups of learners would instantly produce more exciting classroom environments. If today's budgets prevent such installations, try equipping one or two special "word processing" laboratories to which classes can regularly be assigned. Thirty minutes to an hour a day "on terminal" could be thirty minutes to an hour engaged in sustained silent writing.

Much depends on how these important tools are used. As Joseph Weizenbaum reminded teachers of English at our national convention last fall, installing computers in schools can waste resources and curriculum time. Computer literacy is not a substitute for literature and composition and the teaching of English. Rather, we need to look on the computer as a tool to help us enhance instruction in the cognitive processing of ideas. If we do this, computers may evoke far more qualitative improvements in the teaching of English than they do in science or mathematics.

REFERENCES

Bruce, Bertram. "Computers and the Writing Process," Language Arts (in press).

Papert, Seymour. Mindstorms. New York: Basic Books, 1980.

Withey, Margaret. "The Computer and Writing." English Journal, 72:7 (November 1983) 24-31.

Zinsser, William. Writing with a Word Processor. New York: Harper and Row, 1983.

Computers in the English Program: Promises and Pitfalls

Louise P. Matteoni

Introduction

Before beginning a discussion of the promises and pitfalls of computers in the classroom it would be well to clarify certain terms. Computers are machines. They are not programs. As machines, they may be used in a variety of ways. In education, these machines may aid instruction by involving the learner in some aspect of the instructional sequence. This use is referred to as computer assisted instruction (CAI) and includes drill and practice, tutorial, simulation and problem solving programs. Computer managed instruction (CMI) refers to the managing of instruction by diagnosing needs and indicating appropriate materials or approaches to remediation, by assessing progress toward some goal, by indicating grouping according to specified needs, by providing classroom schedules, by issuing reports, by providing access to information, and countless other uses. Finally, the computer may be the object of instruction. This study includes what a computer can and cannot do; how the computer may be used in the workplace, in social situations, in education; the history of the development of the computer, computer programming and languages. This use is referred to as computer literacy. Only the first two, computer assisted instruction and computer managed instruction will be discussed.

Promises

To determine the promises of computers, one must really look at what computers can do well or better than a text and/or the classroom teachers facing a whole class. The computer provides one-to-one instruction; programs permit the student to work alone with the machine. The student paces the computer and is

able to work independently of the group. The computer waits as long as it takes the student to answer. It repeats the information if necessary. It exercises consummate patience. It does not show annoyance, boredom, or rejection. Moreover, it is private.

The computer also incorporates the student's response into the instruction. If need be, the computer presents the same instruction or asks a question related to the same skill several times during the program in a variety of ways. This is done solely for the student needing the instruction. Another student using the same program may not get certain items repeated because this repetition is not necessary. The computer may also move the student to a more difficult level of instruction or to an easier one if the student's responses indicate that the placement needs adjustment.

The computer can present some learning through simulation. The computer can provide graphics to reinforce abstract concepts. In the simulated activity, the computer may telescope time to show the growth of a plant or the development of an artistic impression. It makes the electronic page come to life. It does what a printed page cannot do - it provides movement on the screen replicating that which might take days or months to happen.

The examples above illustrate types of computer assisted instruction; but in order to use computer programs effectively, teachers should be able to identify and to classify these programs according to the instructional mode of the program.

Probably the most common program is that of drill and practice. This type of program is the easiest to write, and at its poorest exemplifies a misuse of the computer. A drill and practice program may be nothing more than an electronic workbook page. Students may be asked to select the verb or adjective in a sentence by underlining, or to select the correct verb form from among several choices. Better programs will provide students with some information should they

select the incorrect answer. This may include a rewording of the question, an explanation of the skill, or a repetition of previous instruction. By and large, drill and practice programs do not attempt to teach. Their strength lies in the repetition of certain items until the student has mastered the skill. Advantages to the use of drill and practice programs are that only those students who need the instruction have to spend the time on it, items can be added or deleted as needed, practice takes place through a different medium.

Tutorial programs are another form of instruction that predominates in the classroom. Teaching takes place in a programmed manner.

I need a red pen.

The word red tells about, or describes, the pen.

Pick another word that tells about the pen.

a. auto b. some c. blue d. pencil e. who

Pick the word that tells about the boy.

The _____ boy cried.

a. sad b. hunt c. tree d. grade e. book

The words red, blue and sad are adjectives. Adjectives tell about or describe nouns.

A third form of instruction that leads to problem solving is simulation. Programs of this type present problems to the student. One problem might require the saving of a troubled ship at sea. A variety of options are presented. Each option has a consequence that must be evaluated in the overall strategy. The student must weigh the advantages and disadvantages, make the decision, and then confront new problems. Simulation is probably the closest type of program that presents the student with problem-solving strategies. One of the difficulties is that the problem solving is done within limited frameworks. Programs which apply problem solving and reasoning skills to social situations and to situations with

perhaps not one but a variety of solutions - or more open ended situations are scarce. One characteristic of the problem solving programs is the attempt to reach closure. Either the student is successful in the mission or fails completely. One reason for this is that computer programs tend to be self-contained, complete programs. There is a need for programs that will do much of what the simulation programs are doing now without the final outcome. Students can be encouraged to work out their individual solutions based upon the information given. The next step would be to share the solutions among a group of students who have faced the same problem and to discuss these with the teacher as mentor.

Perhaps the most promising use of the computer in the English classroom is the use of the word processor. In this, the computer is really a tool for learning. Word processing permits the student to use a keyboard and a video screen for writing at any stage. What is needed is a word processing package and a printer. Both of these are available for different computers, for different levels of sophistication, and for different prices.

Using a word processor, students are able to write on the screen, make corrections in spelling, grammar, or punctuation, delete sentences or add sentences, and move text about. Initial composition may be done on the computer, editing may be carried out, and finally the text may be proofread. Additional software packages may supply the user with a program that will check spelling using a computer dictionary of thousands of words. When the writer is satisfied with the copy, the text may be printed so that it appears in final form in typed copies with no erasures, cross outs, or other editing marks.

For computer managed instruction, a variety of uses may be found and are probably in place in one school system or another. There are programs which permit teachers to assess whether some skills have been attained, by whom they have been attained, and to what extent they have been attained by individual

students. These programs will provide a test that will give teachers further information after the teacher has taught the lesson. The program may give the teacher an item analysis of correct or incorrect answers and in this way point the direction for further instruction if necessary. It may also record the test information on a student profile sheet for later use, thus collecting a data base which may be easily accessed.

Other programs permit teachers to diagnose a student's needs against an identified list of objectives and then to prescribe where, on a continuum representing the scope and sequence, the student may be placed and which materials in a particular program or across programs are suitable for instruction. Some of these programs are tailored to particular printed materials and contain no instruction; others are "complete" programs containing the instructional program on the computer. In almost every case, extensive record keeping is available; and where the school has access to a printer, the records may be shared with the administrative staff, with the instructional staff, and in some modified form with parents. Individual progress reports may be printed for students.

The above are chiefly aimed at instructional direction and record keeping. Another use of the computer in computer managed instruction is in the generation, production, and management of materials. There are at present, programs that will apply a readability formula to text that is fed into the computer. There are programs available that will generate cloze passages by deleting the designated nth word. Other programs may generate graded vocabulary lists for teachers and still others will generate test items by substituting target words in a prearranged format.

As was previously mentioned, computers may keep track of or list objectives for total school use. The objectives may be reviewed and changed with the changing needs of the school. Programs have been designed that keep track of

inventory making future ordering much easier. And, finally, data banks may be built that deal with skill acquisition, individual student profiles, teacher profiles and, in fact, just about any type of information needed. One interesting use of the computer is related to reporting to parents. There is a program available that permits a teacher to give fifteen different grades in eight subjects, to give a general or summative type evaluation, and to write a personal message.

Pitfalls

In an article titled "Reflections on the Educational Potential and Limitations of Microcomputers" in the October 1983 issues of Phi Delta Kappa, Decker F. Walker writes that one of the principal limitations of microcomputers is the lack of good software. (See monograph section on software evaluation.)

Another limitation is one, not inherent in the computer but in its use. A computer is not a substitute for the teacher and for teacher-directed instruction. It is meant to supplement or complement what the teacher is doing. Because of this, it is important to identify the role of the computer program. Is it to function for drill and practice for some skill the teacher has taught? If so, the teacher must know when to arrange the computer lesson so that it falls at the appropriate time. Is it to provide a tutorial experience for a child who did not understand the skill as it was taught or who was absent at that time? If so, the program must reflect the work being done in class and not require skills to which the student may not have been exposed.

A third limitation deals with the rapid growth of the technology. There is fear, and justifiably so, that the machine purchased today may be obsolete by next year or may not be as powerful as a new one on the market. Witness the reluctance of many individuals in buying a computer for home use because a new one is just about to be launched. It appears there is always a new product on the market to be ready within a few months or a year which seems to have more

capability and versatility than any on the market at the present time. Perhaps a concommitant limitation is that programs for one computer may not be used with another. There is a lack of standardization of materials among different computers and even within new models from the same company.

Another limitation deals with the types of learning that are programmable. A quick survey of most programs, especially drill and practice and tutorials, will reveal that they lend themselves better to skills that have rules and generalizations. This is especially true when we view the number of programs that reflect mathematics, spelling, punctuation and other areas which can be formalized. There is a dearth of programs dealing with the humanities and sciences or those knowledges and skills that are not tightly structured. Joseph Weizenbaum of Massachusetts Institute of Technology fears that the use of computers may actually stunt learning if learning is reduced to only what a computer can do or can provide.

Walker points out that, at this time, there is little specific information about how to use computers well in education. Computer assisted instruction is still at the embryonic stage. There is evidence that computers are effective in delivering instruction in certain situations but little evidence to show if these are the maximum uses of the computer, if the number of sessions are the most effective, if the length of the sessions should be varied to produce better results, who can and should benefit from computer assisted instruction, and if, in fact, knowledge of computer programming may be transferred to other situations. This does not negate the value of computers. It serves to indicate the lack of documentation to support one computer assisted approach over another.

A sobering limitation reflects the notion that computers may serve to overcome other types of school problems. In the past, inequities on the distribution of the means of education have been pointed out. Wealthier areas always seem to

have more in the way of materials, programs, teachers, and support personnel than poorer areas. Computers will not change this situation. If anything, the use of computers has already been shown to widen the gulf between more affluent schools and poorer schools. More affluent schools have more computers and have had them for a longer period of time than poorer schools. Students in these schools have more access to computers during school time and before and after school than students in less privileged areas. In addition, the computer will not affect the quality of education in the schools. It will not make "poor" schools "good" schools, and it will not make "poor" teachers "good" teachers.

Finally, it must be stated that the computer is a machine. It does not think or feel for itself. It must be programmed to perform. An essential aspect of all teaching is the interpersonal interaction between teacher and student. The teacher can see if a student is incapable of continuing with a lesson because of a personal problem triggered by something in the home or by another student. The computer cannot. The teacher can see if the student is physically incapable of continuing because of illness or fatigue. The computer cannot. The teacher can interject something highly personal that may reflect an occurrence in the student's day. The computer cannot.

Implementation

If computer assisted or managed instruction is seen as a viable approach to instruction, certain steps to implementation should be identified. Each step may be subdivided into a number of discrete action steps.

Before the introduction of any instructional strategy, the objectives to be met must be identified. Alternatives should then be stated. For the purpose of deciding whether to use a computer, it may be sufficient to state which objectives can be met by non-computer instruction and which may be met by computer instruction. At this point, a decision has to be made whether the computer may

carry out an objective more efficiently, more accurately, and in a more cost efficient manner than conventional means. In addition, an effort must be made to identify who would use the computer: administration, teachers, students, parents, or a combination and in which combinations. Are there gaps which the school has experienced in certain curricular areas or with certain target groups? Have some students not been reached either because they require massive doses of drill and practice or repetition or others because there are too few students to warrant group instruction in a particular area?

Once there is a clear understanding of how and why the computer is to be used, available materials must be surveyed. A decision here may lead a school to feel that current material is not sufficient to meet the objectives and that the school will develop its own materials for the computer. This decision will depend, of course, on whether there is someone on staff capable of writing programs and free to do so. Walker has estimated that it takes approximately 120 hours of instruction for highly motivated teachers to learn to use microcomputers, learn to program in BASIC, and learn to work with students. This means about six weeks of full time study. Most schools will opt to purchase computer programs. Careful criteria for evaluation must be drawn up. Several checklists are available from computer journals and from school districts. These programs must fit into the overall curriculum and be matched to objectives if there is to be a cohesive approach to selection and to instruction.

Only after suitable programs have been identified should the question of which computer or hardware to buy be faced. All programs do not run on all computers. To buy a computer first is to limit the types of programs available only to those that are compatible with the hardware. These may not fit the school's needs. A school purchases a computer for the coursework it offers. Further considerations are the cost of the computer, reliability of the vendor and the types of service that are available.

If the school still decides to move in the direction of computer assisted or computer managed instruction, careful preparation must be mapped out. A budget with both short term and long term goals must be developed. This would include future purchases of software and of peripherals such as disk drives, word processors, printers. The budget should also include some financing of staff development. Staff development must be a part of any preparation prior to and subsequent to the introduction of computers. Perhaps one of the reasons technology has failed in the classroom is that insufficient importance was given to the training of teachers and administrators needed to effectively incorporate the new technology into the existing curriculum. Attention has to be given to scheduling. Decisions have to be made about who is going to use the computer(s) and when this is going to take place. Another consideration may be space limitations. Will the computers be housed in one room for pullout type use or will they be placed in certain rooms to be used by certain teachers? A further precaution would be to assure security of the machines when they do arrive.

The overall approach then is a three part plan: a plan to decide how and with whom to use the computers, a plan to develop an adequate budget for present and future needs, and a plan to provide for ongoing staff development.

Conclusion

Will the teacher be replaced? Good teachers will never be replaced by the computer. What the computer will help a teacher to do is to individualize instruction or to free that teacher to work with individuals. It will help the teacher provide for the child who is out of synchronization because of more basic skill needs, more advanced skill needs, or because of gaps due to absence. It will help the teacher give needed repetition through another medium and at another time. It will permit students to pursue more individualized interests. It will permit a student who would be embarrassed to work at a lower level book or

materials to work at his/her instructional level privately (for no other student need see or be involved) and make as many mistakes or take as long as necessary without anyone being the wiser.

Perhaps one of the most reassuring statements about the role of the teacher in the computer age comes from Wallace Judd in "A Teacher's Place in the Computer Curriculum" in the October 1983 issue of Phi Delta Kappa. Judd says:

> A teacher is still needed to motivate students. Whatever array of math games a teacher may have in the classroom, there will be times when students need to be motivated to use them. A teacher will need to pace student use of the computer, to mix practice with conceptual advances, to intersperse periods of personal contact with periods of intense concentration. A teacher knows when to push a lazy student and when to ease up on a student who is having family problems. These are the personal dimensions of teaching that a computer can never replace. They are also the dimensions of teaching that will increasingly distinguish the excellent teacher from the average teacher.

Hopefully, teaching will never reach the point the telephone company reached. It was reported in the New York Times that the company was experiencing difficulties with its information number. When a caller could not reach the number but did get the operator who could not get the number, the caller was told, "Our computers are down so we can't help you. All we have here are people." (New York Times, December 27, 1983).

THE COMPUTER IN THE ENGLISH PROGRAM:
DISTRICT – CLASSROOM – UNIVERSITY

DEVELOPING A K-12 DISTRICT COMPUTER EDUCATION PROGRAM - ONE DISTRICT'S APPROACH

Frank Ferris

At the time of this writing (Spring of 1984), Spencerport has been involved in a four year project to develop and implement a K-12 computer education program.

In this article an attempt will be made to describe what a moderate size (N=3700), low wealth, suburban school district has been able to accomplish in planning, implementing and communicating a K-12 computer education program. The article will highlight what has been accomplished, how we achieved some of our objectives and where we are going. It is hoped that Spencerport's approach to the developing of a district K-12 computer education program will prove of value to teachers and administrators who are in the middle of a similar project or who are contemplating such a program. Since the writer is a director of language arts/reading, emphasis, where appropriate, will be directed to the LA/Reading Component.

Where We Are

In February of 1984 the Spencerport Board of Education approved a five year K-12 computer education plan. The Board in particular adopted these specific recommendations:

1. K-12 curricular goals, objectives and procedures contained within the following district curriculum documents:

   1.1 Computer Education, Teacher Handbook, Grades K-12 (Dist.-Summer 1981)

   1.2 K-12 Computer Curriculum Guide (Dist.-Summer 1982)

   1.3 K-6 Computer Curriculum Handbook (Dist.-Summer 1983)

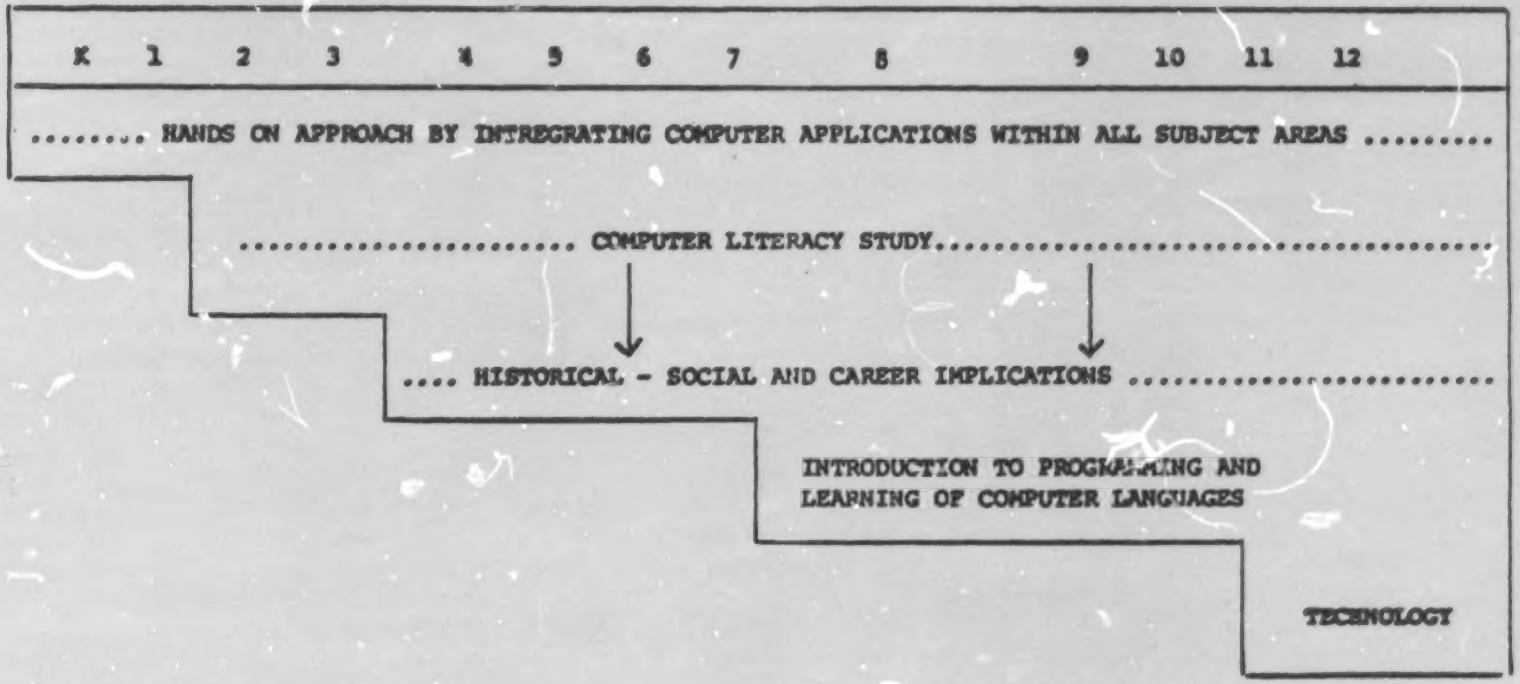
   1.4 Computer Science: Awareness and Literacy, Grades 5-8 (BOCES, Summer 1983)

TABLE I

SPENCERPORT CENTRAL SCHOOLS

OVERVIEW OF K-12 COMPUTER EDUCATION PROGRAM

MAJOR CONCEPTS/COMPETENCIES


K 1 2 3 4 5 6 7 8 9 10 11 12
..... HANDS ON APPROACH BY INTREGRATING COMPUTER APPLICATIONS WITHIN ALL SUBJECT AREAS .....
..... COMPUTER LITERACY STUDY.....
.... HISTORICAL - SOCIAL AND CAREER IMPLICATIONS .....
INTRODUCTION TO PROGRAMMING AND
LEARNING OF COMPUTER LANGUAGES
TECHNOLOGY

1.5 Intermediate Word Processing: Bank Street Writer, Grades 4-8 (Dist.-Summer 1983)

1.6 Introduction to Computer Programing, Grades 10-12 (Dist.-Summer 1983)

1.7 Numerical Methods of Programming Applications, Grades 10-12 (BOCES, Summer 1983)

2. District adoption of the Senior High School computer science course sequence.

3. District adoption of the microcomputer hardware recommendations for 1983-84 and for 1984-85 pending adoption of the 1984-85 school budget.

With Board adoption of these recommendations, approval was given to an integrated, coordinated K-12 computer education program. The major strands of this program are highlighted in Table I which is taken from the 1982 Computer Curriculum Guide.

In Table II, also taken from the 1982 Curriculum Guide, there is a more detailed overview of the K-12 computer education plan. The major concepts and competencies are briefly described and direction is given for the identification of the Levels - K-3, 4-6, 7-8, and 9-12 - where the major concepts will be introduced or reinforced.

Table II

K-12 Computer Education Plan

OVERVIEW OF K-3 PROGRAM

- Understanding of how to operate a computer keyboard through the use of computer simulations and educational programs.
- Computer assisted instruction in math and reading content areas for general classroom use. Other content areas will be included if and when appropriate programs are identified.
- Remedial and enrichment use beginning in math and reading (expand to other subjects as appropriate).
- Awareness of how computers are used in our local community.
- Awareness of how to control the computer through graphics (Turtle Graphics).

OVERVIEW OF 4-6 PROGRAM

- Become familiar with the major parts of a computer.
- Developmental as well as enrichment and remedial use of computer assisted instruction beginning in math and reading and expanded to other subjects as appropriate.
- Computer literacy study continues including a historical look at the development of the computer in terms of early computational devices.
- Career awareness with emphasis on how various jobs/fields use computers.
- Become aware of problem solving potential of computers in specific subjects (e.g. statistics unit in Mathematics).
- Awareness of how to direct the computer through "low res" graphics.

OVERVIEW OF 7-8 PROGRAM

- Look at computer systems in terms of the five major components.
- Use of computer assisted instruction integrated into all subject areas where appropriate courseware is available (simulation, tutorial programs, drill and practice).
- An examination of the history of computers in terms of key personalities and its major stages of development.
- Continuation of computer literacy instruction with an examination of the social implications of computer use.
- Exercises provided to develop problem solving abilities through logical procedures (e.g. flow charting or structured programming).
- Introduction of simple BASIC Programming.

OVERVIEW OF 9-12 PROGRAM

- Continuation of computer literacy instruction with an examination of the variety of computer systems used in society (main frame, mini, micro).
- Use of micro-computer expanded to all subject areas where courseware is available.
- Integrate computer technology careers into ninth grade career awareness curriculum.
- Vocational preparation in business.
- Elective courses in programming (Basic and possible extension to other computer languages).
- Introduction to computer technology (the design and architecture of computers through a study of machine language).

To provide additional direction for an integrated computer program, a Scope and Sequence Chart was developed. In Table III specific topics have been identified with recommended levels of application. Generally the topics are listed from the simple to the complex - for example, Interaction with the Computer, the first

topic, to Technology, the last topic. The topics are also identified for specific attention at various levels to avoid overloads at any one grade and yet to provide for greater depth of instruction as the children mature in this area.

Goals, objectives and activities for each major topic have also been developed for each level. At the elementary level, instructional units based on the goals and objectives for the various topics have been designed and piloted with selected teachers. The intent of these units is to provide for the busy teacher resource units containing goals, objectives, materials and suggested resources for the recommended topics. At the Junior High School (Grade 7 and 8), syllabi for computer literacy and introduction to programming have been developed, piloted and revised. In addition teachers in all areas have been encouraged to use software within their disciplines.

A project of interest that involves students and teachers from grades five through eight centers on the use of word processing to promote writing comprehension. Specific units modeled on content area reading principles and practices were developed in the summer of 1983-84 school year. To facilitate the implementation of the various components of our computer program, a part time (50 percent) computer resource teacher was hired in February of 1982.

At the high school level (grades 9-12) formal courses in programming and computer technology are currently taught. As part of the recommended plan to the Board of Education, a sequence of computer science courses has been developed and adopted. Courses will range from Introduction to Computers through Advanced Placement using Pascal. In addition specific courses and units within courses have been developed and are being implemented in the Business Department. In all high school disciplines there is an extensive involvement of staff in using computer software.

TABLE III

SPENCERPORT CENTRAL SCHOOL DISTRICT
COMPUTER EDUCATION SCOPE AND SEQUENCE CHART

INSTRUCTIONAL TOPICS

TOPIC	K	1	2	3	4	5	6	7	8	9	10	11	12
Interaction with the Computer	X	X	X	X	X	X	X	X	X	X	X	X	X
Components			X		X			X		X	X		
Applications						X				X	X	X	X
Social Implications			X	X		X	X		X	X			
History				X				X		X			
Careers					X		X			X	X		
Problem Solving/Logical Thinking, e.g. Flowcharting					X	X	X	X	X	X	X	X	X
Programming — Awareness				X	X	X	X						
Programming — Introduction									X		X	X	X
Programming — Languages											X	X	X
Technology												X	X

To support these efforts to develop computer literacy and computer competence K-12, the Spencerport School District had purchased approximately thirty-seven Apple Computers prior to 1983, and forty-one Apples and two IBM-PCs in the 1983-84 school year for a total of approximately eighty computers. In addition a large inventory of software consisting of MECC material and commercial software has been purchased also. Approximately $15,000 has been spent in the last three years to build this inventory.

Since the introduction of Microcomputers in the late Seventies, teachers and administrators (N=241) have participated extensively in a variety of ways to become knowledgeable and competent in the various facets of computer education. Over fifty percent of the staff (N=131) have taken at least one college level or inservice course. Of those who have taken one or more computer courses, forty-six (35%) have taken three or more courses. Some staff members have taken ten or more courses ranging from ten to eighteen while other staff members have taken leaves to pursue half year and full year programs in computer education.

In a relatively short period of time - four years - we see evidence that a fairly successful curricular area has been designed and implemented. Clear directions and guidelines have been developed; processes in the form of goals and objectives have been established; curricula of various kinds have been cooperatively designed; personnel have been trained and funds have been provided to purchase software, hardware and to develop curricula. How did this program get started, what factors accounted for progress made? These and other questions will be considered in the following sections.

HOW THE PROGRAM WAS DEVELOPED

The development and implementation of any curriculum, K-12, can be complex and demanding. This is especially true of computer education with its unique vocabulary, technical aspects and general newness on the education scene.

When this writer was asked to become involved in computer education in the fall of 1980, he knew little of the jargon and nothing of the technical aspects and direction that a computer education program should take. However, as Director of Reading and Language Arts in the Spencerport District for fifteen years, he had been involved in many projects designing, developing, implementing and evaluating reading related programs. Basically the author followed the processes and practices that had proved successful in the language arts area. In particular there are three key factors that proved to be helpful in this new and uncharted area: Planning, Involvement and Commitment. These three elements are closely related with considerable overlap and at different stages of program development and implementation require varying degrees of emphasis.

Planning

The literature on the change process is replete with the need for comprehensive planning. The recent research (1) emerging from the "Effective Schools" movement, for example, documents the importance and need for on-going planning. On the State level the research of the Resource Allocation Plan staff (2) that investigated some 250 studies as well as their various projects with underachieving buildings throughout the state yielded strong evidence for the need and advantages of comprehensive planning. The author's experience with the Right-to-Read project (Spencerport was a charter project school) and many other local curriculum projects demonstrated that the key to successful implementation of any innovation in education is planning. There is no substitute for a carefully developed, comprehensive plan.

In the initial stages of our computer education plan, we identified three problem areas or phases that needed immediate attention - 1) Program planning, 2) Selection of software, and 3) Selection of hardware.

To develop such a plan two decisions were made. The first decision was to develop a proposal for a planning grant through Title II - Basic Skills administered by the RAP office. The main purposes of the proposal were to seek funds to develop a master plan for Computer Education, to train teachers and to purchase training materials. With the awarding of the $6,000 grant in January of 1981, a second key decision was made. A District Computer Committee representing classroom teachers, support personnel and district administrators was established to develop the master plan. This writer who wrote the proposal was also assigned to chair the District Committee. From the very beginning the Computer Committee had membership of district personnel including the Assistant Superintendent for Instruction and the Assistant Superintendent for Business as well as interested classroom teachers and specialists.

The group, in this first year, met twice monthly from January to June developing the master plan which was approved by the Board of Education in June of 1981. The plan consisted of definitions of computer literacy, descriptions of anticipated levels of teacher definitions of computer literacy, descriptions of anticipated levels of teacher involvement in computers ranging from users to programmers and identification of individual students including gifted and remedial as well as the general population. In addition the goals and objectives for a K-12 curricula were initially identified and developed. Ad Hoc groups would then be recruited to develop specific curricula and instructional materials based on the suggested goals and objectives for various levels - K-6, 7-8 and 9-12.

In developing the definitions of computer literacy, in describing the needs of teachers and students and in determining goals and objectives, the committee members shared their insights gleaned from a variety of sources: from the literature, from talking to interested educators in other school districts and from college as well as from inservice courses. One source that was particularly helpful

is a report from HumPro (3) that advocated the integration of computers into the total curricula rather than in just the math or science areas. In addition to the laying of the foundation for planning and developing a K-12 curriculum, the master plan also treated two other crucial and interrelated issues: Selection of hardware and software.

The selection of a particular type of hardware system - whether mini or micro - and the selection of a specific brand such as the Apple Computer, Radio Shack TRS-80, Commodore Pet or Atari 800 could have been a time consuming, onerous task. Careful research and study by the local Computing Center (Monroe BOCES #2) and by the Minnesota Education of Computing Consortium (MECC) greatly simplified our task in arriving at a recommendation to purchase Apple computers. Apple II consistently met the rigorous specifications developed by MECC to assure quality performance. BOCES #2's study of the Apple confirmed the wisdom of the MECC recommendation, and in addition the computing center contracted to be a local disseminator of MECC. Since most teachers are consumers rather than programmers, the ready availability of software was and is a critical point in selecting a hardware system.

There are different schools of thought on just what hardware to purchase, depending on what part of the state or country you are in. Actually the different computers available are generally of high quality. Of greater importance are the intended uses of the hardware, the availability of software and the service locally available. In addition it is also important to consider the perceptions of teachers and administrators who will be using the computers. Teachers trained on one system and teachers familiar with specific software developed for a particular system will find it difficult and frustrating switching to a new system. This decision to use Apples was questioned from time to time, but each time the arguments just cited outweighed other considerations.

Involvement

Good planning assures that people affected by decisions are meaningfully involved in the decision-making process. As mentioned above a district computer committee representing all segments of the School Community - teachers, specialists and administrators - determined goals and direction, established guidelines and precedures and generally made recommendations at all stages of the development and implementation of our computer education program. At the building level, computer committees were also set up to advise and assist the principals in administering the newly developing computer program. In addition Ad Hoc groups consisting of interested classroom teachers under the direction of the reading director were organized each summer to carry out specific curriculum projects. The projects were identified by the district committee with input from the building committees.

As noted above instructional materials ranging from teacher handbooks to a spiraling K-12 curriculum to syllabi for specific courses were developed for various teacher groups. In the early stages it was important to provide time for teachers just to sit in front of a computer and experiment. As their knowledge of the computer and its unique capabilities increased, so did their confidence in using this new tool in their classrooms.

Involving teachers in the running of pilot studies was particularly effective in developing familiarity with and support for computers. From the first years of the project, reading personnel and classroom teachers were invited to participate in studies using reading software to improve instruction in basic skills. Of interest too is a current pilot project using the Bank Street Writer, a word processing program, to improve editing skills of low achieving students. As a rule the teachers who were involved in the review and selection of software or the development of curricula such as the lessons for incorporating word processing into

our remedial writing program, grades 5-7, were the ones who did the piloting. Additional teachers were also involved as controls and thus became aware of the various projects. As a result of involving teachers and administrators in the various stages of development and implementation, considerable ownership was developed.

Commitment

Commitment means different things to different people. Looking back from the perspective of four years, I am amazed at the time, talent and money committed to the development of our computer education program. From the very beginning interested teachers, specialists and administrators met after school at least twice a month and often weekly to brainstorm, to become informed on a new application, to plan the next steps, to suggest solutions and to make recommendations. Teachers willingly participated in the pilot projects to try out and evaluate new software or units of instruction.

Busy teachers and administrators found time in their crowded schedules to plan, to implement, to evaluate and to communicate. Initially in each building there was at least one teacher who was really sold on computers and who motivated other teachers to become meaningfully involved. As teachers and administrators became better informed in the concepts, technical aspects and direction of computer education, better decisions were made and better curriculum materials were developed.

A key element in the rising understanding of and support for computer education was the inservice opportunities offered to staff. A variety of offerings ranging from just getting acquainted with the computer to teacher utilities and on to advanced level programming courses were made available to the staff. The courses were taught both at the local BOCES (BOCES #2 - Monroe County) and within the district. BOCES staff, outside instructors and teachers within the

district provided the instruction. The courses were scheduled at convenient times after school and in the evening. No tuition was charged and inservice credit was given. For an experienced staff, however, the inservice credit was little incentive for many teachers have progressed in the salary schedule beyond that point where the inservice credit is of value in salary progression. The convenience of the courses, and their practicality in introducing staff to new ideas and applications and in extending their expertise in this new and exciting area, seemed to be of greater value than monetary considerations.

Another important element in helping teachers to implement the emerging curricula and to apply their new computer insights was the appointment of a part time (50 percent) instructional resource teacher for computer education. This person, a charter member of the district computer committee, goes into classrooms to assist the teachers, consults with the building principal, offers mini-sessions on the use and operations of the computer, trouble shoots problems as they develop, advises on software, does minor repairs and anything else to encourage and reinforce teachers and principals in their efforts to use the computer in various and sundry applications.

When the appointment was made, there was a clearly perceived need for the services of an instructional specialist in computer education. In our first year we had focused on the overall planning resulting in a master plan and the running of various pilot studies. In the second year the K-12 curriculum had just been developed as well as several pilot units at various levels. It was at this point that additional resource help was definitely needed. Although there was pressure to appoint a person earlier to this position, it was decided to wait until a curriculum as well as hardware and software were available for implementation. It proved to be a wise decision.

In the area of software a supportive but cautious policy was followed. In the first year approximately $5,000 was spent on the purchase of software, approximately half for MECC material and half for commercial disks. Before any commercial software was puchased, however, at least two evaluations of the programs were made. As part of a summer project in the first year, Ad Hoc groups of teachers reviewed software and made recommendations for purchase. Prior to the review an evaluation form was developed to guide the analysis and to facilitate the review. In the second and third year of our program an additional $5,000 per year was spent on the purchase of software.

A prudent policy was also adopted for hardware purchase. In the first year of our district plan (1980-81) each of our three elementary buildings and our junior high building were allowed to purchase one Apple II computer using district funds. At the high school level there were nine Apples for use in the Math elective programming courses and four for use in the Business Department. In the second year (1981-82) when various pilot programs were running at the elementary and junior high levels, three additional computers per building were purchased. At the high school level the Math Department received two additional computers and the Business Department added two additional computers. Thus at the end of our second year the district had approximately 37 computers. With the formal approval of the various curricula documents in February of 1984, the Board of Education also released some $50,000 of General Fund and Chapter II monies for the purchase of forty-two additional computer systems and software.

The key point of this discussion is that from the beginning hardware was purchased only after the needs had been clearly identified. In the early stages the pilot studies gave direction to the use of computers. In later stages the district curriculum provided the framework and guidelines for computer use at various levels. Hardware and accompanying software were purchased then to pursue clearly defined goals and objectives in various disciplines.

WHERE DO WE GO FROM HERE

Four years ago it was difficult to distinguish the forest from the trees. A relatively small number of professionals groped to become informed on this new and exciting tool. The members of the district computer committee, in particular, struggled to understand the jargon of this new innovation. The Committee labored to identify the real issues and to make wise decisions that would allow the district to move ahead prudently and to avoid rash and costly mistakes.

As the district looks to the future to full implementation of computer technology throughout the curriculum, K-12, there is a sense of direction and confidence. The careful planning, the meaningful involvement of staff at all levels and the commitment of time, talent and money were all essential in building a program that has clearly defined goals and objectives, that has clearly identified priorities, that has specific procedures for achieving the goals and objectives and that provides ample resources for continued development. A curriculum is in place that will need to be revised and updated. With a trained and increasingly sophisticated staff, the revisions should only improve and extend the use of computer technology.

The crucial issues now will focus on the impact of these new tools. Are we using computers to extend the human potential to solve problems and to provide better and more challenging opportunities for our children? The failures and especially the successes of the past four years give us a sense of confidence that we can harness this new tool in a positive, constructive way.

This is indeed an exciting time in the history of education. Computer technology is here and becoming more affordable. Increasingly better software is becoming available. It is the responsibility and challenge of professional educators to provide the leadership to harness these new tools for the improvement of curriculum and instruction. For those who are also involved in directing or

assisting in the development of a K-12 district computer plan, the approach followed at Spencerport hopefully may provide some guidance and motivation.

References

Edmonds, Ronald. "Program of School Improvement: An Overview," Educational Leadership, December, 1982.

Gereau, Leonard. "Compensatory Education Administrators," Presented at annual conference of New York State Administrators in Compensatory Education, December, 1983.

Hunter, Beverly. "An Approach To Integrating Computer Literacy Into The K-8 Curriculum," Alexandria, Virginia: Human Resources Research Organization, (HumPro), October, 1980.

WRITING ESSAYS IN THE COMPUTER LAB

Tony Howarth

I just stuck my neck out and did it. I maneuvered myself and my tenth grade English class into the computer lab and we write essays using the word processor.

What do I know about computers? Nothing. What did I know about word processors? I'd never really used one, except to sit down at a keyboard and watch the cursor jump around the screen. I looked around for something I could use; but all I could find was a stuffy collection of vocabulary and spelling CAI's, most of which are little better than flashcards—and much more expensive. I decided I had to take the plunge and invent my own curriculum.

Most teachers I've talked with are especially encouraged when I say we really and truly do not need to understand the inner workings of the computer in order to use it. Any more than I have to know how a carburetor works in order to drive to school in the morning. I still remember a conference at Channel Thirteen in New York City when a specialist got up to tell us—in great technical detail—about the word processor. As she talked, the stream of electronically-overheated humanity heading for the exit took on flood proportions.

Kids have the same reaction. When the computer teacher first stood in front of my English class and started to overwhelm them with the intricacies of converting margins and relabeling file names, they rebelled. A class of students who had elected a course in computer studies might have listened, but this was an English class—26 kids—and not one of them there by his own choice. I stepped in, asked for four things: how to turn the machine on, how to load a file, how to insert a correction, how to delete an error. That's all. That done, the students began to type and we were off and running.

And what did we write? Essays--long, detailed, research-style essays wherever possible. I've come to the conclusion that I don't need a word processor to label an envelope...that's a chore done quicker by hand and if it can be done best by hand, then let's do it by hand. Similarly, I think that using the computer to write a short paragraph is a slight case of overkill. I asked the class to develop long individualized projects. I asked them to think in terms of 15 pages minimum. Most of them eventually succeeded. I wanted them to take advantage of the computer's great strengths--its ability to store things away, several documents at a time if need be, and its tendency to make the chore of revising an essay something relatively painless.

Woodlands High School has about 1300 students, 7-12. We are an extremely heterogeneous school, with a wonderfully cosmic mix--we are racially and religiously integrated, and in the last few years we've become host to a marvelous influx of students from all over the world. Our skill levels also cover the widest range of abilities of any school I know, with several seniors admitted to the Ivies on early acceptance who work alongside students who spend all their time in remediation classes.

In tenth grade, students are assigned to heterogeneous English classes in which, during the first semester, we concentrate on writing skills and, in the second semester, we offer an elective program in literature studies.

Last year I had a student who was severely dysgraphic--his papers were a jumbled mess, yet he was obviously a bright boy. At a conference, I asked him if he could type; he said his dad had just bought a word processor. I asked him to use it for daily papers in my writing class. He did and his work improved quickly. It occurred to me that he could profit from further work on the machine, so I went to the principal, Dr. Lorraine Gray, with a request.

I wanted George to go on an independent study project in the spring semester so he could learn to use the word processor more effectively. I felt it was vital for his future. Dr. Gray agreed and we worked it out so that he and another one of my students, a computer buff, could go to the computer lab two or three times a week during my English class period and work there developing individual essays.

At the end of the year I had two reasonably solid essays in hand which I showed to Dr. Gray. She was just as anxious as I was to see how the word processor could be harnessed to the English curriculum, so she consented to my request for a conference with Celia Kreenholtz, the computer specialist, and Jim Johnson, head of the science department. The meeting was visibly tense--I was suggesting that an English teacher run amok among the micro-computers. It sounded like disaster to them, like hundreds of man-hours of extra work either fixing all the machines I would break or nursing my students through the intricacies of a machine which I obviously knew nothing about.

As it worked out, I quickly mastered the machine and did not intrude upon Celia's work. She has, in fact, become very excited about the project herself and has given it her total support. When, subsequently, another tenth grade English teacher asked if she could bring her class to the computer lab once or twice a week, Celia was happy to help.

When the students found out they were going into the computer lab, they were quite excited--something new for one thing, and I told them it was an experiment, that I would be learning with them. I wrote notes home to their parents describing the project, welcoming questions and telling the parents that if they felt their children should not be used as guinea pigs, we would be glad to reassign them. Nobody seemed overly perturbed; one parent came to see me with modest questions; nobody withdrew--ultimately two students told me they weren't interested in using the computer any more, but they weren't interested in anything in any other class either, so their listlessness cannot be blamed on the machine.

Once in the classroom and after our lecture on how to use the machine, we began work with two on a machine. Wrong thing to do!

It is absolutely imperative that students work one to a machine. For one thing, the rhythm of a class period makes this necessary. Otherwise students spend ten minutes loading the machine and talking about what Jedd said to Judd in the hall and how Mr. Smith sent a failure notice home; then we write for about 10 to 15 minutes--an exhilarating time in the room, when everything is quietly intense--everyone working, no less; another 10 minutes or so as the attention span falters and the period winds down; another 10 while we start moving around and getting our documents printed out.

Another reason to assign one to a machine is the matter of privacy. If there are two students to a machine, then one will be working while the other is peering over his shoulder. I doubt if even Norman Mailer could write passionately and without restraint under such circumstances.

The one-to-a-machine policy is tough for obvious reasons. Like most schools, our equipment problem is difficult and will remain so. I had 26 students and 11 TRS-80's, one of them hooked up to a printer. Scripsit is fairly simple and quite good. I asked if we could have access to other machines. Well, okay, there are eight Apples available, but that would mean using the Applewriter, a more sophisticated program and quite frustrating to use. I switched some students to the Apple and together we learned to use Applewriter. At least, the switch eased our crowded keyboards, but Applewriter is not a program for the classroom and I don't recommend it. We're looking at a couple of alternatives for next year, programs we can use on the Apple--Write Stuff, which is the grown-up version of the Bank Street Writer, Word Juggler and HomeWord. I'm hoping that any program we use will have a back-up/save feature, which HomeWord does; two students pushed the wrong keys this year after weeks of work and erased their entire documents!

I insist that the machine is not to be used as a typewriter to make a perfect copy of a pencil draft. "You wanna typewrite, then go typewrite--please use this little beauty the way you use a pencil."

When you sit down to write, I say, you put the pencil on the paper and begin to work and eventually you'll have something on paper that you can erase and fiddle with and scribble over and adjust until it looks and sounds pretty. Just so with the word processor.

One of the most useful tricks I employ to get this point across is to cover the screen with anything that will cover it--a notebook, a piece of paper, a scarf. This forces the child to watch his fingers as he's keyboarding--typing teachers will hate this, but then, this is not a typewriter! It means that the child can let his thoughts go into his fingers and into the machine without being at all, concerned with errors, with grammatical mistakes, with spaces and commas or any of that nonsense. Mistakes, I insist, can be corrected later; to work FAST--thinking all the time--is what matters. I'm looking for total and complete concentration on the thoughts, letting them flow freely, as in writing a journal. I'm always surprised at how willing students are to go through this process. That, of course, is what it is, most of all--a process. And I found that the process was easily transferred to the computer.

I like to think of writing as something which happens in four steps: first, the brainstorming; secondly, discovering the thesis and the shape of the essay; thirdly, rebuilding the paper to conform to the thesis; and finally, the final editing and fine-tuning.

The word processor is most helpful to me in the rebuilding and editing stages. It allows constant revision; in fact, it makes the tedious burden of rewriting something of a game. After a student has brainstormed into the computer, I read through the print-out of the document--that's computerese for <u>essay</u>. I can suggest

further exploration of a topic until a thesis emerges; I can suggest a branching-off into a new area of a topic, particularly if it will support an emerging thesis; I can suggest wholesale destruction of a couple of pages of brainstorming notes; I can suggest wrapping it all up and going on to a new document; I can suggest fine-tuning and refocusing; I can shower the print-out with red ink and insist on a host of corrections; I can insist on fixing the one error I have found in a document, a misplaced comma, perhaps, or a minor misspelling; I can suggest that whole chunks of copy be shifted from one part of the essay to another.

The result of all this has been an individualization that has overwhelmed me. I found myself reading essays and riding herd on the development of students' thinking in a way which had never happened to me before, no longer dealing with the simple external veneer of a pleasantly-crafted essay, but knocking heads with the kids' thinking, struggling to keep pace with what they themselves might be struggling with.

The computer's ability to individualize is double-edged; not only does it allow me to deal with each student on an exhilaratingly personal level, it also augments the way I teach. I found it helped and intensified all the approaches to the teaching of writing that I believe in.

I thought for a long time that the "hand-in-an-outline-first" kind of teacher would be miserable with the computer. Now I'm not so sure. I'm still playing a lot of hunches with this business, as are most of us. But I do believe that the computer, which has been so friendly to my way of teaching, would be equally friendly to the "give-me-an-outline" approach.

A hundred miscellaneous thoughts:

Does a kid need to know how to type to use the computer? No. Ahmed can't type; one of the two students who turned the computer off was a keyboard speedster.

What about the various special functions of the word processor? You learn what you need to learn. When Vicki wanted to do footnotes, I showed her how. When Howard needed to shift a chunk of writing from the end of his essay to the beginning, I showed him how. When I noticed that LaSharon consistently wrote recieved, we hooked up to global search and asked the computer to change every occurrence to received; she clapped her hands with delight when we did that once and began to misspell the word deliberately just so she could use the function. "Need to know" becomes the watchword.

Does the computer make life easier for the teacher? At this point, for me, ABSOLUTELY NOT. I worked harder on this project than I think I ever did in my entire teaching life. My preparation load doubled. Each print-out had to be read from beginning to end, and as the semester progressed, the print-outs got longer and longer and each of them had to be read each time for the revisions that had or had not been made.

On days when we weren't allowed to go into the computer lab because the 7th grade math class was using it, what happened? Poetry, short stories, conferences, but mostly, we marked time, all of us chomping at the bit to get back to our floppies.

Is the computer a sure-fire way to teach children how to write? No. It helped me to do my job, but people write; computers can only byte.

Does the word processor improve a student's writing skills over the long haul? I have no idea. It's probably the most urgent question that must be answered, but I have not been able to assess what happens to a student after he leaves the computer lab and returns to a pencil-driven environment. I'm trying to follow students who went through the lab, but I have nothing solid to support my impressions.

Next year? Well, I'm grateful to an enlightened administration which has not done the obvious--given me a machine and told me to find a way to use it. Instead, they've allowed me to go into the computer lab with appropriate words of encouragement and told me to find my own way of using the machine. They've allowed me to grope and that's what I'll still be doing next year.

And let's face it, that's exactly what we must do. There are still a lot of unanswered questions and none of us, at this point, can be sure of the answers. All I know for positive dead certain is that we can't ever learn a blessed thing unless we do stick our necks out.

Paragraph - Prompt

A Computer Assisted Aid in the Teaching of Writing

Paul J. Helberg

There are two principles that must be considered in the development of a writing program, if it is to be both current and applicable. We hear that writing is, and the teaching of writing should be, a process. We are also discovering that in our technological society we need to be computer literate. It is not necessary that all learn to be programmers; however, we must aid our students as they develop computer awareness and user facility.[1] This article will discuss a project directed toward the teaching of writing as a process via an interactive CAI program that uses the computer both as a tutor and as a tool.

Current research in the area of teaching writing stresses the need to teach writing as a process rather than as a product.[2] In the Rochester Writing Program we have taken this dictum and made it in the cornerstone of our district-wide English curriculum. We have chosen our texts to reflect this approach to teaching writing skills and developed supplemental materials of our own. We have simultaneously begun a long-term adoption of computer assisted instruction with the intention to utilize the best of the existing software and to develop our own where we find a need for a more interactive approach. We have initiated this emphasis at the senior high level, expanded it into the junior high, and are currently focusing on it for the intermediate grades.

As a part of this commitment, we've developed a computer based program that dovetails into our district's desire to enhance the writing skills of our students and its need to prepare and remediate those same students for New York State's writing competency tests. We recognize the need for preteaching, accept the necessity for post testing remediation and see some utility in using CAI for both.

The process of writing is often considered to have at least three distinct though related phases. In the prewriting phase we deal with the conceptual constructs. Here we choose a topic, and then narrow down the material to be examined. Here also we determine general topics to be included and specific subtopics with which to flesh out our bare bones outline. During the second phase of the writing process, we communicate our ideas and reproduce them out in a composition format. The final post-writing phase is characterized by proofreading, revising, editing, rewriting, and evaluation.[3]

In our program through the use of a horizontal outline structure, the student is prompted to focus on a topic, develop his main ideas, follow a specific sequence, adopt an internal coherence, preserve a sense of unity, detail his thoughts and generally organize the concept of his paragraph. The program enlists many of the techniques of sentence framing, expansion, combining and cloze.[4] The post-writing phase is multi-tiered and applied at the paragraph production segment. It makes possible an edit routine, as in a word processing package, and culminates in a computer generated writing evaluation tool.

At its best, CAI offers individualized programs that make the student the controlling force and prepares students for the future while incorporating what is best of the past. We must make sure that the software is, as far as possible, student directed and educationally sound.[6]

"Paragraph-Prompt" was developed as a supplement to the classroom study of the process of writing. Students failing competency tests in writing at the fifth, eighth and eleventh grade levels must be given remediation in writing in addition to the regular school curriculum.

The program is being presented to students at the fifth and eighth grade levels. At this time, it is to be regarded as a pilot project and based on the results of observations and teacher assessments is to be reconceptualized as necessary.

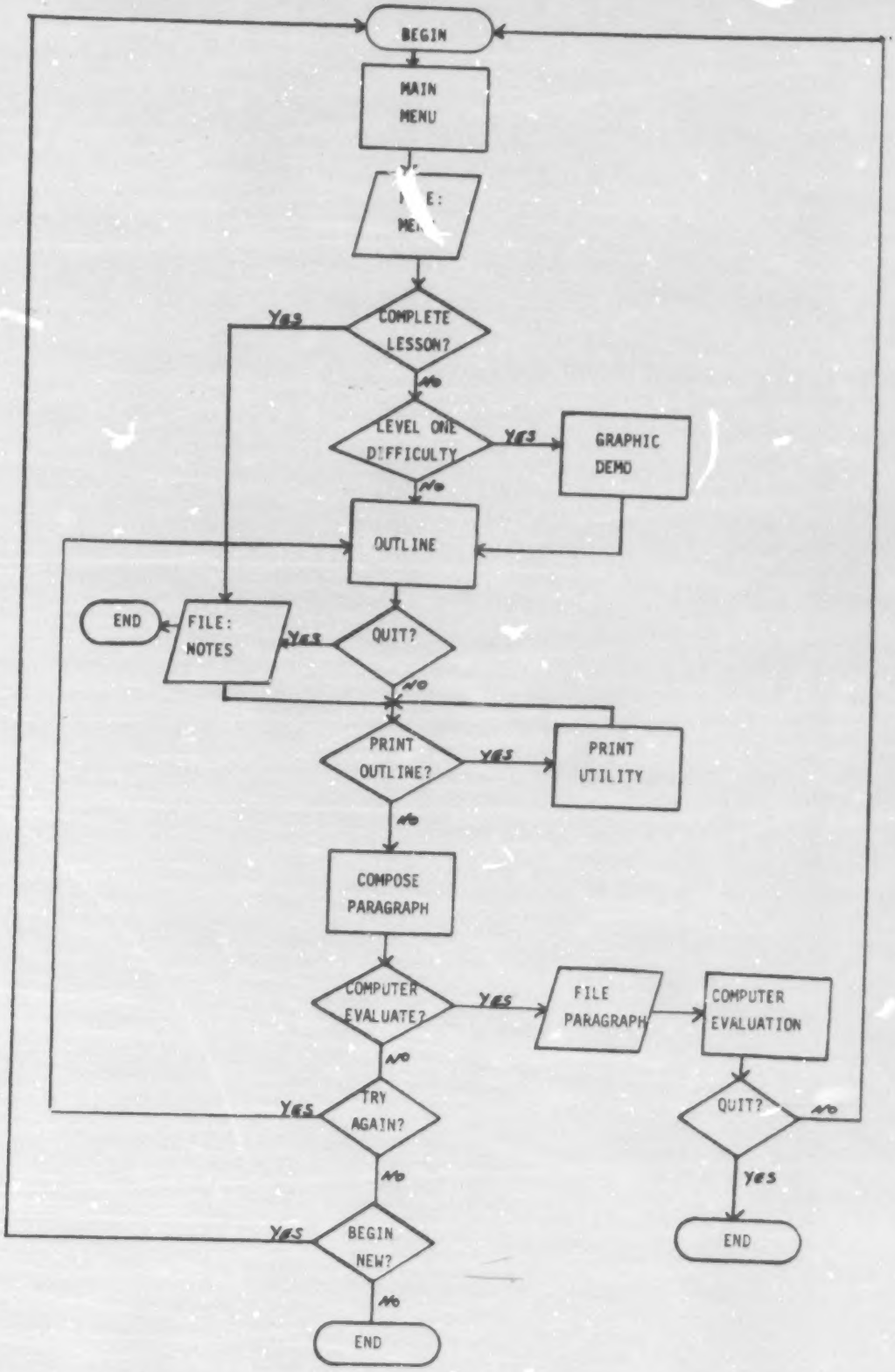

BEGIN
MAIN MENU
COMPLETE LESSON?
Yes
No
LEVEL ONE DIFFICULTY
YES
GRAPHIC DEMO
OUTLINE
END
FILE: NOTES
YES
QUIT?
PRINT OUTLINE?
YES
PRINT UTILITY
COMPOSE PARAGRAPH
COMPUTER EVALUATE?
YES
FILE PARAGRAPH
COMPUTER EVALUATION
QUIT?
YES
END
TRY AGAIN?
YES
BEGIN NEW?
YES
END

FIGURE 1

56

"Paragraph-Prompt" will easily fit the mind set of our computer literate student and present him or her with a multi-level, directed, interactive word processing experience that will both tax and develop awareness of the process of writing and the program contains several distinct components of subprograms (see Figure 1). The first presents the student with a menu of six writing types and then five different titles or situations for each type. The situations are ranked with respect to the degree of difficulty with the first two being the easiest, the second two being of moderate difficulty and the last of greatest complexity. The degrees of difficulty are based on the amount of aid given the student and summarized in Figure 2.

Once the student has selected a type and situation, the main program is piggybacked in. In this program, the student is presented with a short demonstration in the outlining procedure to be used in the program. At this point, if the student has chosen one of the first two situations, s/he is presented with a brief dynamic, graphic demonstration. The animation presents the student with a sequential demonstration of ideas s/he may incorporate into the writing. It allows the student to experience abstract concepts through simulations and suggests starting points for reluctant writers.

Following or instead of this graphic display, the student is presented with sets of type-specific questions and further detail eliciting questions that lead him through the note taking segment of his prewriting activity. The student responds to these generalized questions and sees his answers transposed into an outline and reproduced on the monitor and printed as hard copy (see Figure 3).

Given a class period of between forty and fifty-five minutes, there is the likelihood that a student would not have enough time to develop his notes and then use them as a guide in writing the associated paragraph. To solve this problem, we've built in an option that would allow the student to save his notes to file.

Choose a COMPOSITION TYPE.

MENU

[1] STORY STARTER
[2] DESCRIPTIVE
[3] PERSONAL EXPRESSION - OPINION
[4] PERSONAL EXPRESSION - "IF I WERE.."
[5] PERSONAL NARRATIVE
[6] PROCESS
[7] RETURN TO INCOMPLETED LESSON
[8] END PROGRAM

Choose a SITUATION. [1] = EASY - [5] = HARD

MENU

[1] STRANGE FOOTPRINTS
[2] THE DARK CAVE
[3] THE ELF IN THE REFRIGERATOR
[4] THE HERO
[5] THE BULLY

LEVEL ONE DIFFICULTY

- two titles
- graphic preview
- explicit paragraph prompts

LEVEL TWO DIFFICULTY

- two titles
- no graphics
- implicit paragraph prompts

LEVEL THREE DIFFICULTY

- one title
- open-ended paragraph production

FIGURE 2

Within a subsequent lesson, he can choose from the menu to complete the writing process, from the point of having already compiled his notes.

In any case, the student uses his notes to complete the paragraph associated with the chosen type and situation. The degree of prompting given the student in developing his paragraph varies with the degree of difficuty linked to the situation chosen. The paragraph frames vary from a simple copy, complete exercise to an open-ended, universal word processing mode. Both possibilities focus the student's attention on a sequence and section within the outline and incorporate important transitional aids.

Once a paragraph is written and shown in composite paragraph form on the monitor (see Figure 4), the student is given an option of editing his writing, one sentence at a time.

At this point, the student can further opt for a computer generated paragraph analysis, a return to the same situation or to an entirely new type and situation combination.

The computer generated analysis entails a check of each sentence for correct initial capitalization and end punctuation. At the same time, a tally is kept of the number of sentences and the average number of words per sentence. A further quantification of the writing sample is based on the complexity of vocabulary and measures the number of multi-syllable words. Using this information, a readability level using either the Fry or Flesch-Kincaid (RGL) index is established and some indication of the paragraph's sophistication is possible. An additional check is made to determine whether or not there is a topic sentence, paragraph coherence and sequence, and lastly whether or not there is a significant degree of detail use. These checks are made based on an examination of the paragraph for inclusion of the outline's notes (see Figure 4).

OUTLINE

OUTLINE TYPE - STORY STARTER

PURPOSE - TO DEVELOP A STORY FROM A GIVEN STORY STARTER

QUESTIONS	ANSWERS	DETAILS
What did you do first?	FOLLOW THE PRINTS	
What did you do next?	TRACK THEM THROUGH THE FOREST	Where ? BEHIND MY HOUSE When ? RIGHT AWAY Why ? TO FIND OUT WHAT MADE THEM How did you feel ? CURIOUS
What did you do after that?	FOLLOWED THEM INTO A CAVE	Where ? IN A MOUNTAIN When ? AS IT WAS GETTING DARK Why ? TRACKS LED IN Who/What did you see ? TWO GLOWING EYES How did you feel ? FRIGHTENED
What did you do last?	ENTERED THE CAVE	When ? AFTER LOOKING AROUND Why ? STILL CURIOUS Who/What did you see ? THE NEIGHBOR'S DOG How did you feel ? RELIEVED
What is a good ending?	RETURNED HOME WITH DOG	When ? RIGHT AWAY Why ? TO RETURN HIM TO NEIGHBORS Who/What did you see ? THE NEIGHBORS How did you feel ? PROUD

FIGURE 3

BEST COPY AVAILABLE

THE MYSTERIOUS TRACKS

This morning I looked out my window and saw some strange footprints on the front lawn. First, I decided to follow the prints to discover what made them. Next, I decided to track them through the forest behind my house. I was curious, so I left right away to find out what made the tracks. After that, I followed them into a cave in a nearby mountain. The tracks led in and I was frightened when I saw two glowing eyes. Last, I entered the cave after looking around because I was still curious. I was relieved when I found out that it was the neighbor's dog that I had been tracking. I returned home with the dog right away. I felt proud when I went to return him to the neighbors.

PARAGRAPH ANALYSIS

SENTENCE #	BEGINNING CAPITALS	END PUNCTUATION	# OF WORDS/SENT.
1	YES	YES	17
2	YES	YES	12
3	YES	YES	12
4	YES	YES	15
5	YES	YES	12
6	YES	YES	14
7	YES	YES	13
8	YES	YES	18
9	YES	YES	8
10	YES	YES	12

TOTAL NUMBER OF SENTENCES 10
TOTAL NUMBER OF WORDS 133
AVER. WORDS/SENT. 13

APPROXIMATE READING LEVEL — FOG (RGL) 5.92

MAIN TOPIC INCLUSION IN TOPIC SENTENCE - YES

UNITY AND COHERENCE IN PARAGRAPH - YES

DETAIL NOTES INCLUDED IN COMPOSITION - YES

FIGURE 4

The purpose of the computer check is not to replace the teacher-student interaction but rather to provide an immediate feedback to the student. It will serve as an indication of gross deficiencies and will pinpoint areas that need reworking. The student can assess for himself what to avoid or alter in subsequent attempts. It will be the teacher, however, who will necessarily lead a detailed examination of finished pieces of writing.

Using the program and a computer will allow the student to produce writing with an immediacy and ease that is not possible with pen and paper in a traditional writing production, in which days might be required to complete the cycle. The teacher will be free to give advice on developing creativity and facilitating the prewriting activities and need not check each assignment for proper structure at an elementary level.

The student is presented with a matrix of thirty possible lessons and three levels of difficulty and will have some choice as to the degree of complexity s/he needs. The individualized use of the computer as both a tool and tutor should make the process of writing and the production of the paragraph a much more manageable procedure for the teacher and a much more enjoyable experience for the student. The mere fact that the student can have as many practice sessions and attempts as are deemed necessary should, in the long run, make this program valuable in a classroom setting. The student-computer interaction will demonstrate in a hot medium the inherent logic of outlining and the sequential synthesis of the paragraph.

The computer evaluation is hopefully well conceived. It is non-threatening and produces no ranking and points out possible alternatives routes toward a better finished product.

I hope to have more feedback and evaluation as soon as students have had a chance to discover the program's possibilities and their teachers have had a chance to discover its utility and limitations.

To date, we've used the program on stand alone TRS-80 Model III and IV computers as well as networking it on Radio Shack's Network 3. Built into the program is a feature through which students' notes and outlines can be recalled and printed at a convenient time, if time is a limiting factor.

There has been both an immediate positive response from students and feedback from the English teacher. Students hurry to the writing lab to be first on-line. They compare and discuss strategies they've employed and notes they've developed. They seem genuinely interested in organizing sequential, organized, interesting paragraphs and have been more than willing to rewrite both notes and paragraphs in order to incorporate new ideas and better formats.

In observing students working on the program, it has become apparent that lessons in notetaking needed to be pretaught and that the student should be familiar with sentence combining strategies and sentence expansion techniques. Students seemed interested in learning how to develop a more sophisticated writing style and complexity to their writing and see the necessity of incorporating a number of related detail notes into their simple frame sentences.

It is too early to tell how well the students will do with the program or what further carry-over will find its way into the classrom or even what further changes will need to be made in the program so as to increase its utility and facility, but it seems to have combined the appropriate combination of CAI and current research in the field of teaching writing.

REFERENCES

1. Taylor, Robert P. (Editor), The Computer in the School: Tutor, Tool, Tutee. (New York: Teachers College Press, 1980), p. 231-235.

2. Irmischer, William F., Teaching Expository Writing. (New York: Holt, Rinehart and Winston, 1979), pp. 9-17.

3. Irmscher, William F., pp. 78-89.

4. "Individualized Language Arts: Diagnosis, Prescription, and Evaluation". (Weehawken, N.J.: Office of Program Development, Division of Research, Planning and Evaluation, Department of Education, State of New Jersey, 1974) (ESEA Title IV (c) Project: 70-014).

5. Standiford, Sally N. Et. Al., Computers in the English Classroom - A Primer for Teachers (Urbana, Illinois: ERIC Clearinghouse on Reading and Communication Skills, 1983).

6. Taylor, Robert P., pp. 129-135.

BIBLIOGRAPHY

- Daiute, Colette, "Word Processing - Can It Make Even Good Writers Better?", Electronic Learning, (March/April, 1983), p. 29-31.

- Poirot, James L., Computers and Education. (Austin, Texas: Sterling Swift Publishing Company, 1980).

Adapting the Writing Process to the Microcomputer

Joseph DeRoller, Diane Hammar, Richard Stear

"Guarded pessimism" - this phrase borrowed from Peter DeVries aptly describes the attitude of many English teachers toward computer-assisted instruction. Although prepared to think the worst about it, they are nonetheless willing to grant that it might not be as bad as it seems. These teachers regard the merits of computer instruction dubiously because the programs they have seen do what they feared computers would do rather than what they had hoped computers might do. They had hoped computers would provide new ways to address an enduring problem; they found the same old solutions packaged in a new format.

The authors of Design & Memory: Computer Programming in the 20th Century, have described the interaction of a person and a computer program as a system in which information is exchanged.[1] To the extent the information is predictable and controlled, the system is closed. For example, programs that drill skills or present the user with multiple choices, only one of which is correct, are closed systems. Such programs can be used to test knowledge acquired elsewhere or to develop skills prerequisite to more advanced learning, but their value as a teaching tool is extremely limited. Programs which provide users with information they can manipulate as they see fit are more open and more useful as tools for learning. Word processing programs would fit into this category. If programs are devised that enable users to generate or expand programs, these programs are more open yet, and thus more likely to help users learn new things. Peter Huyck makes an important distinction between education and training. "Education," he says, "involves assimilating general principles, while training involves acquiring specific skills."[2] Computer programs can be written to accomplish either goal. Drills provide practice in skill building; an open system educates.

How does it do that? The open system uses computer capabilities imaginatively to simulate and stimulate mental processes. The computer can receive, store, and retrieve information. It can search for and respond to key words, illustrate with graphics and movement, quantify, classify, and reply. Through a technique called branching, it can present the user with many options and gradually transfer control from the program to the learner. When these capabilities are incorporated in interactive programs, the learner becomes a discoverer. The computer can recognize, count, classify, and graph. These capacities can be used in a program that analyzes a sample of writing for specific characteristics. It can thus make writers more aware of the qualities that characterize their style. On the basis of this awareness, writers can make better-informed stylistic choices.

Thus far, the examples considered involve pieces of writing that have reached at least the first draft stage of composition. Here is an example of how the computer can be used during the prewriting stage of the writing process.

Given a pool of randomly grouped notes on a topic, the writer has to regroup these notes according to their logical connections. The computer can illustrate, by means of graphics and movement, the mental process the writer is performing. Some students come to an understanding of this process only as they see it happen before them on the screen. It is a learning experience of the first order.

In addition to the capacities of the computer to match, simulate, or illustrate mental processes, there are psychological fringe benefits that accompany the use of the computer. The first is the prestige factor. Computers are associated with intelligence. Students with a poor self-image "feel smarter" when they work on the computer. Quite often, to our mutual but pleasant surprise, they are. Herbert Kohl sees in microcomputers the possibility for "the rebirth of open education in America."[3] In many ways, computers are equalizers. To cite one example, they eliminate the problem of illegible handwriting, as well as the halo effect

surrounding the neatly written but otherwise vapid composition. Moreover, the computer has infinite patience. For the first time, really, students can work at their own pace without pressure from either peers or the teacher to work faster or be left behind. If for no other reasons than these, computer-assisted instruction deserves our attention.

However, there are other compelling reasons to explore this new approach to learning. Recent reports have detailed the deficiencies of education as it is. Specifically, in A Nation at Risk, a report of the National Commission on Excellence in Education, the eighteen member panel appointed by Secretary of Education, Terrel H. Bell, presents three indicators of risk in American education. Twenty-three million American adults are functionally illiterate as shown in tests in reading, writing and math. The College Board Test results reveal consistent decline in English. Of the seventeen year olds in the United States, only twenty percent can write a persuasive essay.[4]

In addition, the Carnegie Report tells us to emphasize writing as an instructional priority. Among the new basics in education is computer technology. The New York State Board of Regents is telling us we must require computer technology in junior high grades.

It is just a matter of time before districts decide to commit resources to computer-assisted writing instruction. The question then becomes: How should a district begin? The City School District of Rochester began its computer-assisted writing program by deciding which group of students would get the initial programs, what those programs would be, who would write them, and how they would be delivered to the students.

High school juniors and seniors who had not passed the Regents Competency Test in Writing were chosen as the pilot group. Conventional methods of writing instruction had not helped these students, but they were eager to work with

computers. Programs were developed in the three areas of writing competency tested by the State: the business letter, the report, and the persuasive composition. Teams consisting of an English and a math teacher were recruited to write the programs. The English teacher created the content; the math teacher made it appear on the microcomputer screen.

The Rochester competency-based computer software programs translate the process approach to writing into the idiom of the computer. While at first it might seem that the two would be incompatible, it is, in fact, an ideal marriage. Not only are students fascinated with the microcomputer, but its endless patience, positive reinforcement, and true individualization of instruction also make it well-equipped to lead regular or remedial students through the stages of the writing proces.

In the pre-writing stage, the computer programs developed in Rochester present students with models of the type of the writing taught. Using pre-writing techniques such as framing and sentence starters, the programs help students define their audience and purpose and plan what they will write. After instruction in and practice on those unique aspects of the type of writing being studied, students proceed to the writing phase which develops directly from the pre-writing activities they have done. Here, too, the computer guides students through this phase of the process by making comments pertinent to the essence of the writing, not the accidents.[5] Those accidents can be corrected in the post writing phase which also allows for reshaping or revising. Additionally, the computer provides students with a two-fold response: as intended audience it responds to the content of the writing and as teacher-audience it analyzes the form and style of writing.

THE BUSINESS LETTER

The business letter of complaint program takes full advantage of the process approach because it focuses on audience and purpose in such a real way. The chief

feature of this program is the computer's response to the letter that the student types in.

To write an effective complaint letter for the Regents Competency Test in Writing, students must have a strong sense of their audience and a clear understanding of their purpose. They must be able to define clearly the problem about which they are complaining and offer a practical solution to it. The letter program is composed of three parts, one which allows the student to practice the problem paragraph of the business letter, one which allows practice on the solution paragraph, and one which practices the entire letter, from heading to signature.

Each section follows the writing process in microcosm, with its own pre-writing, writing, and post writing activities. The pre-writing phase typically includes a model and some instruction. The student can repeat this section, if additional instruction is needed, or skip over it and go directly to the writing. In the writing phase, the student types in a response to one of a number of different problem situations, and is allowed the opportunity to make corrections or additions. The post writing phase consists of the computer's response to the student's letter. If the student writes the letter correctly, the computer as audience responds with a letter addressed to the student which answers the student's complaint. The computer as teacher then goes on to analyze the student's letter in some detail. An incorrectly written letter brings a different computer response, one which points out why the complaint cannot be solved, e.g., it might point out that the student has neglected to include the price paid. It also truncates the analysis process to a simple examination of the letter, sentence by sentence, to look for errors.

The letter program does all this through the use of checks for sentence elements or key words and phrases. It checks the number of strings used, and compares them to strings in files for such letter parts as the inside address, salutation, and closing.

THE REPORT

To write the report on the Regents Competency Test in Writing, students must first reorganize a random list of notes. One of the biggest problems teachers face in preparing remedial students for the report question is helping them to visualize how the notes can be regrouped. A strategy that has worked is allowing students to use scissors to cut up the list of notes into single pieces. Then, by tackling the task much as one would a jig-saw puzzle, even the slowest of students can rearrange the notes into meaningful groups. Next, students can sort out the notes within each group and finally decide upon the sequence of the groups themselves. Taping the notes on a large sheet of paper after all the organizing is completed allows students to do the pre-writing activities in a very tactile way and end up with a concretely organized list of notes. It also effectively side-steps the often painful process of transcribing the notes onto scrap paper.

The computer allows students to follow the same process for organizing notes that has just been described. It directs students to start organizing by looking for a pair of notes that belong together and then to continue by adding one note at a time to the original pair. If students cannot add to the first pair, they are directed to form another pair and build onto that. Students proceed by pairing and adding to pairs until all the notes are organized.

As can be seen in the report program's menu below, students progress from organizing a small group of easily arranged notes to a larger group of more complexly related notes:

A. organizing seven notes for a one-paragraph report

B. writing and editing a one-paragraph report

C. organizing ten notes for a two-paragraph report

D. writing and editing a two-paragraph report

E. organizing fourteen notes for a three-paragraph report

F. writing and editing a three-paragraph report

As in the letter program, the writing process is delineated clearly in this program: pre-writing activities occur in A, C and E, and writing and post writing occur in B, D and F. To illustrate this process, segments from the two-paragraph report are shown below.

After students have selected letter C from the menu and entered such information as name, date, teacher and assignment number (there are a total of 18 different reports), students are given a brief overview of the writing process with which they are about to work. Because this program is interactive, students are addressed by name and shown a large rectangle that will give directions and feedback. The rectangle reappears each time the information on the screen changes and guides students through the pre-writing activities which, in this case, are primarily organizational.

Here is what students see on the screen.

****

SITUATION:

There is a new student in your school who has just arrived. Many students have already met her. You want to introduce her to the entire student body. An article in the school newspaper is a good way to do this.

You jotted down notes when you spoke with the new student. Your notes are as follows:

Press (ENTER) to continue

A.) Misses friends from back home

B.) Carmen Santiago - new student from California

C.) Things she likes about school

D.) Teachers friendly and helpful

E.) Lives on Clinton Avenue with parents and 3 sisters

F.) Many after-school activities

G.) Member of Junior Class; age 17

H.) Interesting courses offered

I.) Moved to New York three weeks ago

J.) Cafeteria food delicious

.....

ABOVE ARE THE NOTES TO BE ORGANIZED.

ENTER TWO LETTERS THAT YOU THINK GO TOGETHER.

.....

GROUP 1:

GROUP 2:

****

If students choose two notes that do belong together (for example, A and B), the computer removes the notes from the list and places them below the box in Group 1. If students choose two notes that do not belong together, the computer asks them to search for another pair.

After students have found an initial pair, they are directed to add to that pair, one note at a time. When they can no longer add to the pair, students are directed to press X which allows them to search for another pair.

If there are notes remaining after students have worked on both groups, the computer isolates them and for each one, asks students to which group it belongs. If students are still unable to place a note, the computer will do it for them.

Once the notes are in groups, the computer directs the students to pick out the main idea for each group. It visually reinforces a correct choice by moving the main idea note to the top of the group. If students choose the wrong note, the computer tells them to try again. After students have chosen the main ideas for both groups, the computer asks them to decide if the two groups of notes are in the

proper order or if they should be switched. By the conclusion of the pre-writing phase of the report program, students have sorted the notes into groups, identified the main idea in each group, and determined the best order for the groups. At this point, the computer gives the students a printout of what they have organized thus far and directions about what to do next.

A sample printout looks like this.

****

DIANE HAMMAR 4 / 15 / 83 : 49

SITUATION:

There is a new student in your school who has just arrived. Many students have already met her. You want to introduce her to the entire student body. An article in the school newspaper is a good way to do this.

You jotted down notes when you spoke with the new student. Your notes are as follows:

.....

TAKE MY WORD FOR IT, YOU WOULD BE BETTER OFF
IF WE DIDN'T SWITCH THE TWO GROUPS AROUND.

.....

GROUP 1:	1	A)	Carmen Santiago - new student from California
	2	E)	Misses friends from back home
	3	C)	Lives on Clinton Ave. with parents and 3 sisters
	4	D)	Member of Junior Class; age 17
	5	B)	Moved to New York three weeks ago
GROUP 2:	1	A)	Things she likes about school
	2	E)	Many after-school activities
	3)	B)	Teachers friendly and helpful
	4)	C)	Interesting courses offered

5) D) Cafeteria food delicious

These notes are now partially organized, DIANE. They are separated into two groups. You have identified the main idea note in each group, and the groups are in the correct sequence. All that is left for you to do, alone, is to order the detail notes in each group.

Use letters of the alphabet to label the order. For example, A goes with the first detail note, B goes with the second detail notes, C with the third, etc., etc., etc.

THERE IS NO ONE RIGHT WAY TO ORDER THE DETAILS. Any way that makes sense is fine. Organize your notes now. Write on this printout.

Next, write a complete sentence for each of your notes. You MAY COMBINE two or more notes into a single sentence. Make sure that each sentence has a SUBJECT, a VERB, and expresses a COMPLETE THOUGHT!

Write your sentences in the space provided in your booklet. Put them in the order you decided upon when you lettered your notes.

Before your report is complete, you must write a short introduction. Use the information from the situation statement. Re-read the situation. Decide which parts of it make a good introduction for your report. Try to put the information in your own words. Your introduction only needs to be a few sentences. Write your introduction in the space provided in your booklet.

Your final task is to type your report into the computer. To do this, choose item D from the report MENU. The MENU is obtained by pressing the organge button on the right side of the keyboard.

PAIR SEARCH ERRORS 1

SINGLE NOTE ERRORS 1

ONE AT A TIME NOTE ERRORS 0

MAIN IDEA NOTE ERRORS 0

GROUP ORDER ERRORS 1

****

In the printout, students are directed to finish their organization of details and then go to their student manual and compose sentences according to the final organizational scheme. The work done in the student manual prepares students for the writing and editing phase of the program.

Item D of the report menu launches students into the writing and editing phase of the ten-note report. Detailed instructions are given, and students are asked to type their report, paragraph by paragraph, into the computer. The students' work is filed in memory only after they have been allowed to go back through the report, line by line, and make any desired changes. These changes may be in mechanics, such as spelling or capitalization, or they may be in content, such as the addition or deletion of information. When students have edited to their satisfaction, the computer asks them if they would like their report checked. If they answer, "Yes," students are given a printout of their final draft and an analysis of what they have written. Below is a sample printout.

****

HERE IS A COPY OF YOUR REPORT, Diane.

There is a new student in our school who has just arrived. Her name is Carmen Santiago, and many students have met her already. I would like to introduce her to all of you.

Carmen Santiago is a new student from California who moved to NY three weeks ago. She lives on Clinton Avenue with her parents and three sisters. She is 17 years old and a member of the Junior Class.

There are many things Carmen likes about our school. She says that the teachers are friendly and helpful and that there are many interesting courses offered. The cafeteria food is delicious, according to Carmen. She also enjoys the many after-school activities.

****

IT APPEARS THAT YOU DIDN'T USE ALL OF THE NOTES IN THE REPORT. THE FOLLOWING NOTES ARE MISSING:

misses friends from back home

****

Excluding the introduction paragraph, this report should be written using at most 10 sentences. Since you used only 7 sentences, you probably used the sentence combining techniques that your teacher presented. Just in case, you should check for run-on sentences.

****

The number of words in each sentence looks like this...

SENTENCE NUMBER	NUMBER OF WORDS	
1	12	XXXXXXXXXXXX
2	12	XXXXXXXXXXXX
3	10	XXXXXXXXXX
4	15	XXXXXXXXXXXXXXX
5	11	XXXXXXXXXXX
6	12	XXXXXXXXXXXX
7	9	XXXXXXXXX
8	16	XXXXXXXXXXXXXXXX
9	8	XXXXXXXX
10	8	XXXXXXXX

Do you think you need more variety...or is there too much?

****

Your sentences begin like this...

1 There is a new...

2 Her name is Carmen...

3 I would like...

4 Carmen Santiago...

5 She lives on...

6 She is 17 years...

7 There are many...

8 She says that...

9 The cafeteria...

10 She also enjoys...

Do you think you need more variety...or is there too much? IF THE BEGINNING OF A SENTENCE DOES NOT APPEAR ABOVE, YOU HAVE FORGOTTEN CAPITALIZATION OR ENDING PUNCTUATION.

****

The printout shows that students are told such things about their writing as sentence lengths and sentence beginnings (stylistic information), and inclusion or lack of inclusion of all the notes in the report. Completeness of thought is difficult to check on the computer aside from the obvious scan for capital letters and end punctuation. The printout does, however, isolate each sentence students write (omitted from sample printout due to space limitations). Often students can determine if a sentence is complete or not by looking at it out of context.

THE PERSUASIVE COMPOSITION

The essential elements of the persuasive composition include (1) a sense of the audience and purpose, (2) the statement of a definite opinion and two different, appropriate reasons, (3) the use of several factors or examples to support each reason, (4) a basic composition format including a well-defined introduction, body, and conclusion. To accomplish student mastery of these elements, the persuasive program builds sentence by sentence to a paragraph, and paragraph by paragraph to the composition.

The program begins by presenting a model composition sentence by sentence and a format diagram showing the introduction, body and conclusion paragraphs. There are ten computer-generated composition situations. After students have written several compositions using computer-generated situations, they have the

opportunity to write a composition on a subject of their own choice, following the format practiced earlier. The last section of the program allows students to analyze the finished composition.

The program begins with a model and brief overview of the whole composition. Each individual section reinforces this introductory phase by pulling the specific element being practiced from the model, reviewing it, and analyzing it for format. Students can either practice each composition element exclusively, build and follow their own composition from stage to stage (introduction, body, conclusion, analysis), or do both. For example, in the section on the introductory paragraph, students first see the model composition's introduction and a format diagram of it. Their attention is called to the situation and audience presented in the first sentence. Then students practice situation and audience identification until they are confident enough to write their own introduction in response to one of the ten situations provided by the computer. Additional sentences of the introduction are presented in a similar way.

Each composing section of the program follows, in microcosm, the writing process for the whole composition, proceeding from model and format presentation, to practice, to writing, to revision. The analysis section then runs through one final check, asking students to examine each sentence, one at a time, in terms of specific elements of that sentence. The following is an example:

****

This is our opening sentence:

Mr. McMahon, I know that you are considering cancelling the senior prom because of problems which occurred last year.

Check for your AUDIENCE (to whom you are writing) and your SITUATION (what are you writing about). DId you include them?

PRESS (Y) IF THE ANSWER IS YES,

PRESS (N) IF THE ANSWER IS NO.

****

It goes on to check sentence length, variability, and sentence beginnings; gives a word count and prints out the whole composition.

The program accomplishes these tasks by storing the student sentences as separate elements, paragraph by paragraph. At various times, it looks for and checks key words, capital letters, end punctuation, and whole sentences.

This program, as do all the others, uses the student's name and words of praise. With infinite patience it provides endless opportunities to "get things right". The program also anthropomorphizes the computer, e.g., "Type your sentence into MY memory banks," instead of, "Type your sentence into THE COMPUTER'S memory banks." In this way, the computer takes on a distinct personality and becomes a partner in the composing process.

To use these programs effectively, Rochester has begun setting up a computer writing program city-wide. Currently, all of the city's comprehensive high schools and one of the two junior high schools have computer writing labs. Seven of the labs consist of seven TRS-80 Model IV student microcomputers networked with one double-disk drive host computer and a DMP 420 Radio Shack printer. The eighth lab has fifteen student models and a host computer and printer. Each lab provides both computer workspace and writing or conference workspace.

The program was begun with an inservice for English Department Chairpersons, Writing Resource Teachers, and one other teacher from each school's English Department. Ongoing formal and informal on-site inservice, as well as the use of outside experts as speakers, is a part of the Rochester plan.

The lab's primary purpose is to provide remedial writing experiences for those students who have failed in traditional classroom settings. These students will use the District-developed software primarily, but will also use commercially developed software. Other lab users will include reading classes, special education classes, and regular English classes.

Since it is still in its developmental stages, no formal study has yet been done of Rochester's computer-assisted writing program. However, some preliminary observations can be made. First, students seem universally excited by this approach to writing and enjoy it immensely. Second, the teachers involved share their enthusiasm. Perhaps most important, the program has proven effective in improving writing skills. The first group of students, approximately 50 juniors and seniors who had previously failed the Competency Test in Writing, passed the exam at the next testing after having regularly worked on computers. The success rate was 100%.

Future plans include creating more writing software, splitting the networks in each lab to allow for more independence and program choice, and adding hard disk drives to each lab.

Another major area of writing experience for these students will be word processing (network Scripsit). Word processing will provide all students with a painless and immediate way to do the reshaping and revising necessary in the post writing stage of the writing process. Flexibility is the real key to fluency and mastery.

REFERENCES

1 Peter H. Huyck and Nelllie W. Kremenak, Design & Memory: Computer Programming in the 20th Century (New York: McGraw-Hill Book Company, 1980), p. 79.

2 Huyck and Kremenak, p. 61.

3 Buff Bradley, "Machines Don't Dehumanize, People Do: An Interview with Herbert Kohl," Classroom Computer Learning, IV (September, 1983), p. 24.

4 David Pierpoint Gardner et al., "A Nation at Risk: The Imperative for Eduational Reform" printed as "An Open Letter to the American People," Education Week, (April 27, 1983), p. 12.

5 Janet Emig, Components of the Composing Process Among Twelfth Grade Writers, Unpublished doctoral dissertation, Harvard University, 1969.

COMPUTERS IN THE ENGLISH CURRICULUM

BALL STATE UNIVERSITY—A HISTORY

Linda Meeker

Two years ago, faced anew with remedial students after a six year reprieve, I was determined to short-circuit the learning patterns that had led them through twelve years of schooling to my classroom. But I could no longer confront with youthful zeal stacks of workbooks and reams of exercises individualized to meet their needs. In my frustration I resolved to extend my students' television and video game experiences into the classroom to achieve my purposes. Computer assisted instruction (CAI) was in the throes of birth at Ball State, but I had just completed a computer workshop and was eager to try what seemed to be a viable, possibly superior, approach to individualized instruction.

Others in the English Department who are committed to CAI entered that stage through similar back and side doors, some by using word processing or statistical programs for linguistic analysis, and others by responding to the logic, challenge, and excitement of using a new tool. For a time we worked with individual goals, sharing frustrations, successes, and information. But our goals for the department and for our academic programs were nebulous.

During 1982-83, though, the English Department was fortuitously included in plans for a new building to be completed and occupied by Fall of 1984. Immediately we were confronted with the necessity for establishing departmental goals, coordinating the needs of our various academic programs and individual researchers, and planning space and equipment requests. The Indiana Legislature provided additional impetus for our efforts: in a recurring annual appropriation beginning July 1, 1984, Ball State will be allotted $1.5 million for computer literacy,

$1,350,000 of which will purchase hardware and software, and $150,000 of which will support faculty development. For Ball State the legislative appropriation offers a unique opportunity; for the English Department the combination of monies and new space means a strengthening of the Writing Program, English Education Program, computer-related graduate courses, faculty research, and special summer programs. Not all wisps of the pipe dream will become reality, but we are in the transitional stages toward a strong program integrating computers into our curriculum and our academic lives. Our program will continue to rely upon both the University's mainframe and our microcomputers because the capabilities of each answer different needs.

We began our CAI ventures with a package of 250 grammar lessons obtained from Notre Dame in 1980. Before we could use them, though, the lessons needed to be combined, reformatted, and programmed for Ball State's DEC 10 mainframe. Before that major project was begun, a young faculty member, Michael Allen, obtained an Office of Instructional Development Grant that allowed him time to format six grammar lessons he had designed, which were then programmed in Fortran. About that time Academic Computing became interested in a European system, GNOSIS, which runs under ALGOL 68. Herbert Stahlke, an English faculty member new to Ball State but experienced with mainframes because of his linguistics research, agreed to oversee the conversion of the Notre Dame lessons into GNOSIS. Herb conducted workshops during winter and spring 1981-82 and enlisted the aid of faculty and graduate students to complete the necessary programming. Our investment of over 400 hours of programming time reduced the original 250 units to 50 functioning lessons for our Writing Program students. We discovered limitations in branching, string analysis, and record keeping that prevented us from achieving the flexibility we ultimately desired; but we did have interactive lessons that did not simply turn workbook pages for a student. We had

also provided Academic Computing a sufficient test of GNOSIS to make an informed decision not to provide technical support for it but to seek a better lesson delivery system.

In the spring of 1982, when we had approximately 15 lessons running, I began using CAI in my remedial classes. Having encountered some surprisingly negative attitudes toward CAI among my students earlier that year, I conducted a pilot study to determine whether that negative attitude was in fact present among EN 102 students and whether their attitudes would alter with exposure to CAI. It seemed apparent that in order for instructors to use CAI effectively, they must be aware of students' attitudes, anticipate the fears underlying the attitudes, present the CAI material so as to minimize those fears, and continually monitor the students' progress so as to identify problems as they arose, solve them, and minimize student frustrations with the mode of instruction. Each instructor intent on using CAI would, in some way, address those attitude-related issues; but for many instructors who themselves were novices on computers, the results of an attitudinal study could provide effective guidelines for use of CAI.

Research during the last decade concerning student use of CAI ranges from biology to naval science, German to economics, all suggesting that a person's attitude is the most important aspect of a successful human-computer relationship. Studies have reported generally positive student assessments of CAI, but most have relied upon a relatively small number of students using very few computerized lessons over a short period of time (Oates, 1981; Okey, 1976; Cottey, 1982; Farrell, 1982). Studies reporting positive student attitudes toward the highly-developed PLATO system are an exception because of the large data base available (Magidson, 1975, 1978; Meredith and Ikari, 1978; Jenkins, 1981). But none of the studies are definitive because there are so many variables in hardware, software, computer environments, and requirements. Ball State has neither PLATO facilities

nor, in those remedial courses, a population with a normal range of SAT scores and academic experiences. Our students' attitudes could thus easily skew the CAI effectiveness.

Insufficient numbers of subjects in my pilot study rendered the results inconclusive; the initial questions multiplied. Was a negative attitude toward CAI indeed present among EN 102 students? Would attitudes shift with exposure to CAI? Do attitudes correlate with ability as indicated by SAT scores? Do attitudes affect apparent CAI effectiveness? The results of a study by Kevin and Liberty (1974) seemed to imply that CAI was more useful to poorer students than to average or superior students since it provided a structure for learning (science) which they previously lacked. Since student grades improved in the second semester, it appeared that the contribution of CAI accelerated over time.

In the fall of 1982 I expanded my study to include six remedial (EN 102) sections and fourteen randomly selected sections of the regular first quarter composition course (EN 103). Three of the remedial sections (N=54) received computer-aided instruction on grammar and punctuation. The other three sections (N=54) received conventional instruction. No significant differences were found in the proficiency exam performance of these groups, but there was a considerable savings of time that would have been spent grading workbooks and exercises.

Attitudes toward computers and previous computer-related experience were assessed with a 24-item questionnaire administered to both remedial groups and the larger group (N=347) of regular composition students. Responses were solicited in three categories: overall attitudes toward computers; attitudes toward computers as learning tools; and experience with computer-related instruction, jobs, or recreation (video games). Attitudes toward computer-related instruction for <u>all</u> students did not correlate significantly with math or verbal SAT scores. Female <u>math</u> SAT scores, though, did significantly correlate (positively) with attitudes

toward computers, and male verbal SAT's were significantly correlated with attitudes. The range of SAT scores for EN 102 (N=91) was from 200 to 510; the mean was 333. The range of scores for EN 103 (N=294) was from 240 to 690; the mean was 387.

The identical questionnaire plus 21 forced-choice questions assessing the student's CAI experience comprised the attitude post-test for both remedial groups. Significant overall pre-test post-test attitude shifts were found in the experimental remedial subjects but not in the control remedial subjects. There seemed not to be spontaneous shifts in the group not exposed to CAI, strongly suggesting that the attitude shifts in the CAI group were the result of exposure to CAI, the independent variable. Johnson and Plake (1981) had also found that initial responses of anxiety and apprehension concerning the computer environment yielded as students became familiar with the system. Surveying "Two Decades of Computer Based Instruction Projects," (1983) Kearsley and Seidel similarly concluded that students learn more quickly and willingly with computers than with traditional methods.

Armed with positive reinforcement, several other Writing Program faculty began in 1982-83 using the complete set of grammar lessons on the DEC 10 with their composition classes. Their experiences confirmed the problems I had documented with my CAI study group's weekly progress questionnaires: availability of terminals, timesharing, "down" times, and sluggish responses. Ball State was outgrowing the capacity of the DEC 10.

Currently Ball State is preparing for transition from the DEC 10 to a cluster of VAX minicomputers in May, 1984. Because ALGOL 68 will not run on our new system, our grammar lessons in their current form are destined for obscurity. Circumstances thus require that we examine our curricular goals, the means of achieving those goals, and the quality of materials currently in use. The grammar

lessons specifically have been tested and proven useful for Writing Program classes and, this past year, with the acquisition of terminals for the Writing Clinic, have become an integral part of the tutoring program. We have determined to safeguard and improve this considerable asset.

Our proposed course of action will take two summers and an academic year to accomplish. Our principal goal is to convert all of the existing GNOSIS material to Renaissance, the new course authoring system available on the VAX. Because of the great power of Renaissance, a PLATO based system, we will be able to set up the lessons so that they interlock, allowing a student to move from one to another as his skills dictate. The package will be much better integrated and much more effective than was possible on the DEC, and certainly more flexible than would be tutorials over the same material programmed for our microcomputers. A student using a tutorial on sentence structures, for example, could be shifted easily and automatically to another on verb forms if his verb skills seemed to be hindering his ability to respond to the sentence structure exercises.

Faculty development funds from the legislative appropriation to Ball State are supporting a four week intensive workshop on campus this summer that should allow the three primary faculty members involved in this project to gain the necessary programming expertise.

As an interim solution to ensure availability of the grammar tutorials during the next academic year, we will recode them this summer in LESSON, a system written on campus and available in BASIC on the VAX. LESSON and GNOSIS are similar enough that recoding would not require extensive revision of the tutorials, and our major efforts could be directed toward our primary goal. Currently we do not anticipate any other curricular uses of the mainframe, although individual faculty will continue to utilize it in their own research.

Our commitment to microcomputers, specifically to the Apple II series, began with the purchase of six Apples and two Epson printers during the spring and fall of 1982. Prior to that time, English faculty and graduate students intent on learning and using microcomuters competed for time on the few available elsewhere on campus. Herb Stahlke, Director of our Teaching English as a Foreign Language (TEFL) program and of the Intensive English Institute, had motivated so many of us that it was only practical that we establish our own Computer Assisted Instruction Research (CAIR) Lab. Institute funds purchased those first Apple II+ machines.

By Fall Quarter 1982 over 70 lessons in grammar, spelling, and usage were available on disk for non-native speakers of English and composition students; graduate students in the TEFL program were developing some of their own teaching materials; and English graduate students and faculty were using the tutorials in Applesoft BASIC and PASCAL to familiarize themselves with the computers and to develop CAI materials in English and TEFL. Since then our computer literacy workshops and requirements in both graduate and undergraduate courses have begun to tax the capacity of the CAIR lab.

For the English Department, the legislative appropriations, our new facilities, and the consequent need to coordinate our various computer uses have mobilized us. In the absence of administrative guidelines from the University, the English Computer Committee this year has formulated computer literacy goals for our faculty that acknowledge various degrees of interest and use. We have scaled down our dreams to the realities of space in the new building so that our plans for hardware include an expanded CAIR Lab of 15 Apple IIe's with printer support; a computer classroom of 26 Apple IIe's with printer support; a Writing Clinic that includes the VAX terminals; the Intensive English Institute lab equipped for cassette, video, and computer learning programs; and assorted VAX and Apple terminals in individual faculty offices.

Our decision to use the Apple IIe exclusively in our academic programs emerged from our substantial commitment to Apple already in terms of hardware in the CAIR Lab, software, software development, teaching, and research. Expanded use by English Education courses urges that we be compatible with the hardware used in the majority of the school systems in the State of Indiana, that being Apple. The wealth of educational and utility software available for Apple, some suitable for English and the humanities rather than for business and administrative activities, contributed to our decision, but even more significant is the Apple's capacity for upgrading, for providing us the flexibility we require. To be able to run the best educational programs, our computers must operate several different software systems. Currently our Apples are equipped wth the resident 6502 8-bit processor and Z-80 CP/M cards; they also can be equipped with 8088 and MC68000 microprocessor cards to expand flexibility even further. We could make use of all current eight-bit, sixteen-bit, and thirty-two-bit educational programs and do research with any of the popular microprocessor operating systems. Finally, we see compatibility within the department as essential. The Writing Program computer classroom must contain machines compatible with those in the CAIR lab so that software developed in the CAIR lab can be used in the classroom.

The CAIR lab itself must provide facilities for coursework, research, software development, and computer literacy workshops. Three proposed graduate courses are designed to train graduate students in the humanities in microcomputer techniques for instruction in their disciplines. Such training requires extensive hands-on time, more than can be provided in the heavily scheduled CAI classroom. Students in these courses will be developing instructional programs, experimenting with utility and CAI packages, and preparing innovative software for the humanities. For this they will need a laboratory equipped with a wide range of hardware peripherals and of software. Methods courses in English Education will require

students to prepare prototypes of CAI lessons in language, literature, and composition appropriate for the public schools.

Nationwide research into the composing process has led to many studies testing whether computers improve students' writing ability. Research projects with computers have studied anxiety, invention strategies, organizational techniques, revision options, and stylistic considerations. Our current CAIR Lab facilities seriously hamper our attempts to contribute to this body of research. My most recent study, for example, of the effectiveness of two invention programs designed by Minnesota Educational Computing Consortium, was hampered first by the necessity to manipulate class and student time, a necessity that will be removed when we have our CAI classroom in the new building. Our proposed CAIR Lab and CAI classroom should allow Ball State to contribute significantly to research on the relationship between computers, composition, and instruction.

A major goal of the CAI Research Laboratory is to provide a place for software development. Graduate students in English have already developed five software packages as master's projects, and several others are in progress. Several faculty, too, have developed programs either for demonstration or for use in their classes. Our goal is to be able to develop and revise software for testing and use in the CAI classroom. The CAIR Lab, as planned, provides the necessary facility for such high level work. We have found that our existing laboratory also provides an arena for programmers to meet and to exchange ideas, a valuable asset to our goals. We hope that some of our software will be marketable.

Important to all our goals for the CAIR Lab are the computer literacy workshops we offer. During the last calendar year seven workshops have been given in the 8-unit CAIR Lab covering word processing, basic programming, and software demonstration, with an average attendance of eight. Two five week workshops are currently in session, and demonstrations and an Open House are

planned for later this quarter. Such demonstrations and the Open House we view as part of our task of establishing public awareness that computers do belong in the English Department.

The CAI classroom will be used primarily, although not solely, in conjunction with the Writing Program. Capabilities will include drill and practice in grammar, mechanics and spelling; sentence combining exercises; prewriting programs; revising and editing programs; record-keeping; and reading comprehension and literature quizzes. Our initial focus is on an integrated writing process to be used by all Writing Program courses and available for any other English course requiring papers. With expanded facilities, the program might be made available to any university student writing papers for any course.

Although our hardware commitments make acquisition of the Writer's Workbench program in use at Colorado State University highly unlikely, we are striving for the thoroughness and efficiency that I have seen in that program. We have ordered HOMER and are eager to explore its potential. But we are also concerned with the prewriting or invention stages of the composing process, and there is little of the same calibre and scope as the Writer's Workbench offers for the later stages of composing. Studies that focus on the effectiveness of stimulating the composing process with computer programs are comparatively few and primarily anecdotal. Hugh Burns' model for an invention program, described in his dissertation "Stimulating Invention in English Composition through Computer-Assisted Instruction," stimulated development of Valerie Arms' CREATE program at Drexel University. Similar courseware development and research were reported at the Computer Courseware Swap sessions at the 1983 Conference of College Composition and Communication in Detroit, March 17-19, 1983, by Lillian Bridwell and Donald Ross (University of Minnesota), William Marling (Case Western Reserve), Dave Davis (Southern Illinois University), and Helen Schwartz (Oakland University, Michigan).

Joseph Lawlor, in Computers in Composition Instruction, points to two difficulties in developing computer courseware for composition, one in instructional design, the other in technical design. Given those difficulties, it is imperative that we persist to develop effective composition courseware and to test promising existing courseware for effectiveness. Our CAI classroom will provide us the facilities for such testing and composition research.

While computers in the English department most frequently suggest word processing--a means for homogenizing words, phrases, and fragments into the verbal Velveeta of a finished manuscript--we at Ball State University intend to help expand that image.

APPENDIX

Computer Assisted Instruction Research Laboratory
Department of English
Ball State University

The Computer Assisted Instruction Research (CAIR) Laboratory is equipped for training students in computer literacy and in techniques of computer assisted instruction (CAI) and for preparing CAI materials. The CAIR Lab is also equipped to assist faculty members and graduate students in computer-based research. The CAIR Lab has the following hardware and software:

Hardware

7 Apple II Plus microcomputers with the following configuration:
- 48K RAM Apple II Plus Microcomputer
- 16K RAM Apple Language Card
- DOS 3.3 Disk Operating System with secondary disk drives
- Panasonic CT110M 10" Color Monitor (6 systems)
- Zenith 12" Green Screen Monitor (1 system)
- Z-80 card

2 EPSON MX-80FT Printers with Graftrax
1 Apple Graphics Tablet
1 D.C. Hayes Micromodem II
1 LA34 Decwriter and modem for communication and mainframes
1 DEC Gigi terminal with BARCO monitor and modem for communication with mainframes

Software

2 Apple Pascal Language System
1 Apple Logo Language System
2 Apple Pilot CAI System
1 Visiterm Communications System
1 Screenwriter II
1 DOS Tool Kit
1 Utopia Graphics Tablet System
1 Super Disk Copy III
1 SRA Computer Discovery
1 Pilot Animation Tools
1 Supermap
7 CP/M 2.2 Operating System
7 Wordstar
3 Bank Street Writer
1 MECC Character Sketch
1 MECC Writing a Narrative
Assorted utility software, including Beagle Brothers and Nevada products

References

Arms, Valerie. "Creating and Recreating." College Composition and Communication, 34 (October, 1983), 355-58.

Bridwell, Lillian. "Revising Strategies in Twelfth Grade Students' Transactional Writing." Research in the Teaching of English, 14 (October, 1980), 197-222.

Burns, Hugh. "Stimulating Invention in English Composition through Computer-Assisted Instruction." Diss., University of Texas at Austin, 1970, ERIC ED 188-245.

Cottey, Patricia. "An Overview of the Computer as Teacher: A Progress Report of a Research Project to Introduce Diagnostic Testing and Computerized Instruction into the Composition Program at Northeast Missouri State University." Paper presented at the Annual Meeting of the Conference on College Composition and Communication, San Francisco, March 18-20, 1982.

Davis, Dave. "TOPOI"; a computer software package developed by Dave Davis, Dept. of Higher Education, Southern Illinois University, Carbondale, ILL. Copyright 1982.

Farrell, Edmund J. "And It (Shall) May Come to Pass: Speculations on the Future of English Education." Paper presented at the Annual Meeting of the National Council of Teachers of English Spring Conference, Minneapolis, April 15-17, 1982.

Jenkins, Tracie M. and Elizabeth J. Dankert. "Results of a Three-Month PLATO Trial in Terms of Utilization and Student Attitudes." Educational Technology, 21, No. 3 (March 1981), 44-47.

Johnson, Craig W. and Barbara S. Plake. "Interactive Study Lessons to Complement ANOVA." Paper presented at the Annual Meeting of the American Educational Research Association, Los Angeles, April 13-17, 1981.

Kearsley, B. Hunter and R.J. Seidel. "Two Decades of Computer Based Instruction Projects: What Have We Learned?" Technological Horizons in Education Journal, 10 (January, 1983), 90-94, and 10 (February, 1983), 88-96.

Kevin, Richard C. and Paul G. Liberty. "The Influence of Students' Orientation Toward College and College Major Upon Students' Attitudes and Performance in a Computer-based Education Course." Paper presented at the American Educational Research Association Annual Meeting, Chicago, April 15-19, 1974.

Lawlor, Joseph, ed. Computers in Composition Instruction. Los Alamitos, CA.: SWRL Educational Research and Development, 1982.

Magidson, Errol M. "Student Assessment of PLATO: What Students Like and Dislike About CAI." Educational Technology, 18, No. 8 (Aug. 1978), 15-19.

Meredith, Gerald M. and Mitchell I. Ikari. "Students' Evaluation of a Computer-Based Instructional System in Higher Education." Psychological Reports, 43 (1978), 1093-1094.

Oates, William. "An Evaluation of Computer-Assisted Instruction for English Grammar Review." Studies in Language Learning, 3, No. 1 (Spring 1981), 193-200.

Okey, James R. and Kenneth Majer. "Individual and Small-group Learning with Computer-Assisted Instruction." AV Communication Review, 24, No. 1 (Spring 1976), 79-86.

SOFTWARE EVALUATION AND SELECTION

COMPUTERS IN EDUCATION

Renée Levitt

Will computers change classroom instruction? Will they improve student performance? Will computers provide information, drill, practice, and the interactions required in language arts classrooms? Or, are they destined to become another obsolete technological device in the classroom taking its place beside the unused televison set, the controlled reader, and other discarded machines that once promised to revolutionize education?

Over twenty years ago, B.F. Skinner wrote in The Scientific American that "scarcely an area of human activity has been more resistent to scientific analysis and technological change than education. There is no dearth of suggestions for improving education." By 1983, authorities agreed that students must understand and be able to use computers because the revolution in communication and information technology had made computers a fundamental tool for acquiring knowledge and solving problems.

Today there are approximately three computers in every elementary school and eleven in every high school in the country. It has been predicted that these numbers will double each year for the next several years. Computers are in the schools but must become an integral part of schooling if they are to have a positive effect.

In the past, parents did not believe that they were depriving their children if they did not provide overhead projectors at home. Parents did not purchase controlled readers or regard the family T.V. set as a learning tool. Children were neither sent to T.V. camps nor provided with home language laboratories. But today, media advertisements are orchestrated to make parents feel guilty if they

do not purchase computers for their children. Summer computer camp enrollment is at peak levels and computers are being purchased by parents for home instruction in record numbers.

Parents, as well as business leaders, are demanding that schools introduce computers into the curriculum and classroom. However, the purchase of computers is not enough for the new technology to achieve its potential in schools. A philosophy and a strategy for computer use must be developed by schools and districts to guide and encourage computer integration. Long range goals must be identified and short range goals must be tailored to meet the needs of each school.

Software that is educationally sound, factually correct and utilizes the unique capabilities of the computer must be identified and evaluated. Teachers and students should use software prior to purchase, whenever possible. The program (software) selected will affect the level of achievement of the school computer plan. The software must be compatable with the computer since the hardware is not standardized and requires specific software.

Schools or districts should consider the following criteria when selecting software:

- Do these materials contribute to the objectives of the instructional program?
- Are these materials suitable for the age, ability level, emotional and social development of the students for whom the materials are being selected?
- Do the programs take advantage of the capabilities of the computer? Is there immediate feedback? What happens when students make errors? Is there branching for additional instruction?
- Is the program easy to use?
- Is the program motivating to students?

- Are the directions clear?
- Is the material factually accurate?
- Can the staff get answers to problems by phone or mail?

In addition, classroom teachers must ask:

- How will recordkeeping be accomplished?
- Must each student be monitored?
- Can the program be modified?
- Is the feedback (to my students) effective and suitable?
- Will the cues and prompts help my students answer questions correctly?
- Can my students control the pace and sequence of the program?
- What happens when my students answer incorrectly?
- Are there safeguards to insure that my students are processing the material to answer the questions and not guessing?

Administrators and staff must become computer literate, that is, to know about and have experiences in using the hardware and software. School personnel must be able to communicate in the language of the computer; to boot up, to input information, to differentiate between bit and bytes, and ROM and RAM. A plan for staff development to create computer literacy is an essential goal of an overall computer plan. If not, a district or school will be by-passed by the computer revolution or financially overwhelmed by it.

Another component of the plan must be to identify and schedule those students who will use the computer. A district or school, with a small number of students may be able to provide computer instruction to all students. Another, with a larger population may be forced to limit computer instruction to a few. Who should benefit from computer assisted instruction? The underachievers? The overachievers? The average student? The entire student body? Each school and district must plan for computer assisted instruction and provide strategies to accomplish their stated goals and objectives.

Computer instruction has been successful when the program has enhanced the process of learning the subject. An important advantage of this type of instruction is the intimacy and the non-threatening rapport of the relationship between the student and the program. In addition, the computer adjusts its pace for presenting information so that it accommodates each individual student. Programs are objective; instructional decisions are based solely upon the student's performance. Computer instruction maintains a consistent friendly tone and mood; therefore many students are able to achieve more as a result of this kind of individual and private instruction.

Computer technology has been observed and experienced by many students at home. Others have used computers and programs in mathematics, science, and business classes in school. Many more have become familiar with computers in the game arcades or in jobs at banks, supermarkets, and in offices. Administrators and teachers of language arts must develop courses of study and instructional strategies that utilize the unique capabilities of the computer. Schools and districts must be ready for the change. They must have a philosophy, a plan that includes long and short term goals, a budget, staff development programs and evaluating procedures.

Ten years ago, Daniel Bell in the Post Industrial Society predicted that, "in the post industrial society, technological skill becomes the base of power and education the avenue of power." Today, business, government, and education leaders and parents are reiterating this prediction. All discussions about improving education turn to computers as a matter of course. As educators, we are charged with the responsibility to provide our students with an education that will allow them to function in a technologically advanced and rapidly changing world.

Computers can change classroom instruction. They can provide information, drill, practice, and the interactions required in language arts classrooms.

Teachers will be freed from menial tasks of recordkeeping and simple drill and practice activities. Computers and teachers will be able to improve the quality of instruction and the level of achievement of our students.

The Bits and Bytes of Software Evaluation

Francis Zappone

The library of computer software available for use in the classroom numbers in the thousands. This ever increasing volume of courseware creates new burdens and new responsibilities for educators, and it demands new skills.

Some important changes

When microcomputers burst upon the educational scene in the late 1970's, the vocabulary of BASIC was absorbed into the lexicon of many educators. Teachers learned to speak BASIC and students were taught to program. The benefits of learning to program these electronic marvels were clear. Students need to learn to control this new and powerful learning tool and in learning to program students would develop their much neglected thinking skills. Programming is nothing if it isn't logical. Computers were empty heads waiting to be filled with the logical instructions of those educators and students who could speak their language, but many changes have occurred.

The microcomputer is now more powerful and programming languages have become less complex - e.g., PILOT, PASCAL, LOGO. Some large companies, such as Bell & Howell (PASS) and Zenith, have even developed computer programming systems which allow one to create sophisticated programs using English as the programming language.

The change which affects the greatest number of computer users, however, is the growth in the number of sophisticated preprogrammed applications (software) for school use. Software is being produced at a rate of 1,000 new programs a month according to PC Telemart, a computer catalog company, and more than half of them are for the home/education market (Pollack, 1983). In addition to this

overwhelming volume of products, the newest pieces of software on the market are the product of teams of programmers working several months to develop a single program. Teachers, if they have the expertise, do not have the time, or capital, to equal such efforts. A piece of software for $50, $60, or even $150 is a more prudent investment then 2 or 3 teachers working 15 to 20 hours to produce even the simplest of programs. Software has reached a point of quantity and quality where knowing how to program a microcomputer may be a secondary skill for most educators. Clearly, it is becoming increasingly more important to become a skilled evaluator of computer software. But, can the criteria used to evaluate other educational material be applied to the evaluation of educational software?

Criteria for Evaluation

Curriculum needs, student needs, and price provide a sound basis for evaluating most educational materials. However, computer software selected based on these criteria alone has a good chance of never seeing the inside of a disk drive. Of course curriculum needs are important, but the computer is an interactive technology and users expect more from it than they do from other instructional media. As a result, the evaluation of computer software, first and foremost, must balance the educational value of the software with the technical quality of its design.

Getting Started

Evaluation of software should begin with a complete description of the program. It is unfair to criticize a program if you do not have a precise picture of what it is expected to do. Too many software reviews, for example, will criticize a piece of software for not having a management system, but fail to take into consideration that the software was written for a 16K computer, too small to accommodate such a feature.

Crucial in the description of the software is the publisher classification. Is this program a game, a simulation, a tutorial, a drill and practice, or some other classification? The classification establishes an expectation. (Coburn et al, 1982) Games should have rules; tutorials should teach; simulation should be realistic. The classification gives focus to the evaluation. A game with unclear rules, or negative reenforcers may confuse the user and negate any learning. Bizarre simulations, although intriguing, may distract the user from the intended outcomes.

Once classified a complete description of a piece of software should include the following information:

complete title

name of programmer(s)

memory size required to run program

brand compatability

operating instructions (DOS, C/PM, MDOS)

peripherals needed (number of disk drives, printer, etc.)

number of disks or tapes

support materials (tests, exercises, etc.)

age/grade level of intended user

content (# and title of lessons, subject area)

warranty

cost

Where do I look?

A complete description is essential to a useful evaluation. But, this description should not come from a catalog, a colleague, an advertisement, or even from a review. It should come directly from the publisher, from the user's manual which accompanies the software package. Of course, such a prize is not easy to bag, but it is worth the effort.

The best source is the publisher. Call and ask for a copy of the documentation. A cooperative publisher is the first good sign. If you eventually order the software, you know where to go if trouble arises. Usually, however, some persuasion is necessary. Offer to return the documentation in 10 or 14 days; offer to pay for it. If you are calling to place some other order, ask if they would send the manual along. Also, the larger publishing companies still have field representatives, invite one to visit and bring along the user's manual. Sometimes the documentation is not available through the publisher. All is not lost. Get to a computer fair, not hard to find these days, where you know the publisher is having an exhibit. Carefully examine the user's guide as others ogle the software demonstration. Or, see if you can develop a contact who has purchased the software from among the colleagues present and borrow his/her copy of the manual.

The next best source for a complete description of a piece of software is a non-commercial review, a review from a professional organization you respect (The National Council of Teachers of Mathematics comes to mind) or from an organization whose existence is not dependent on advertising (EPIE - Educational Products Information Exchange, for example). However, resist the temptation to read their review. Their insights may be useful later, but, for now, get the facts, just the facts.

Other sources to consider are the curriculum libraries of nearby colleges and universities, neighboring school districts, or local software retailers.

Locating the Software

Previewing a piece of software before purchase is difficult to do. Publishers, fearful of piracy and/or damage, are reluctant to fill requests for software not accompanied by a purchase order, but preview is possible.

Some publishers will send software on preview, most will not. Many publishers will offer a demonstration disk. Beware. These disks, although entertaining and free, are about as useful to an evaluator as excerpted movie segments are to a critic. The best source for preview of an entire program is someone who has already purchased it. College and university libraries or media centers, state education curriculum libraries, public libraries, nearby school districts, or someone in your school district are all good sources. (Basil, Burroughs, 1984).

An innovative source for software is a videotex data service such as CompuServe. Such information networks not only provide access to a wide range of data through phone modem hook-ups, but also provide access to educational software for a subscriber's use.

The process of locating both the documentation and the software is initially tedious and time consuming. Is it worth it, especially if the software in question is a $40 drill and practice program? Yes. With practice, the process becomes less tedious and less time consuming. Also, even $40 sitting on a shelf is wasteful. Budget bulges are often the result of too many $40 follies.

What do I look for?

A complete review looks for answers to a series of comprehensive questions. Those questions should reflect both educational and technical concerns of the reviewer, and they should be carefully planned before actually viewing the software. When designing these questions, some issues should not be overlooked.

Technical

Does the program do what I expect it to do?

Is the program easy to use?

Are graphics used? If so, do they help or hinder the presentation?

is sound used? If so, does it help or hinder? Can you turn off the sound?

Is color used? Is it necessary?

Is the text on the screen clear? Is there too much text on the screen?

Is each frame clearly formatted? Can objects be distinguished easily?

Is the program free of errors?

Does the user have some control over content, presentation, or outcome? If so, how much?

Does the program make appropriate use of the technology?

Is branching (automatic movement to other parts of the program) used? Is random generation used?

Educational

Does the material support the curriculum?

Is the scope of the material covered too narrow or too broad?

Is the material covered appropriate for the grade level?

Does the feedback reenforce or negate learning?

Is the content or the presentation accurate? Is it free of sexism, biases, or stereotpying?

Was the program field tested? What were the results?

Is the tone of address appropriate for the intended user?

Does the format reflect sound pedagogy? Does it reflect an awareness of current research?

Is some pre- and/or post-evaluation system provided?

Is the program motivating?

Is the program designed to be used by one or more students?

(Heck, et al, 1981)

A Suggested Procedure

A comprehensive review of software should be systematic and it should be a shared responsibility. Procedures will, and should, vary according to the situation but each should at least do the following:

Step 1 - Briefly run through the program to become familiar with basic operations.

Step 2 - Run through the program as an unsuccessful student might, making incorrect response or operational errors, ignoring suggestion made in the documentation.

Step 3 - Run through the program as a successful student would, avoiding intentional and careless errors, relying on the documentation to resolve difficulties.

Step 4 - Use a checklist or evaluation form to record your impressions.

Step 5 - Write a narrative which reflects your impressions.

Step 6 - Locate and read other reviews of the software.

Step 7 - Have another member of your department review the software.

Step 8 - Confer before making a decision.

Conclusion

The comprehensive evaluation of computer software has two major benefits. First, it assures a high return on the dollars invested. Carefully selected software may wear out, but it will not be thrown out. Second, students who use this

software will be introduced to quality applications of the computer beyond the Donkey Kong kind.

References

Basil, Robert, Robert Burroughs. "Playing the Network Software Game", TLC: The Educators Guide to Personal Computing, Jan. 1984.

Coburn, Peter et al. "Choosing Educational Software", Practical Guide to Computers in Education, Addison-Wesley Publishing Company, 1983.

Heck, W., Johnson, J., and R.J. Kansky. "Getting Hardnosed About Software: Guidelines for Evaluating Computerized Instructional Materials", Mathematics Teacher, Nov. 1981.

Lathrop, Ann, and Bobby Goodson. Courseware in the Classroom: Selecting, Organizing and Using Educational Software, Addison-Wesley Publishing Company, 1983.

Pollack, Andrew. "Slugging It Out On the Software Front", New York Times, Oct. 16, 1983.

JUST BECAUSE THE BEAR DANCES

Muriel Mandell

Sixth graders inserted Bank Street Writer disks in computers, pecked away happily composing personal narratives, poems, sports stories, and book reports, and then casually ran off their writing on attached printers. That software is now available for the Apple, the Atari, and the Commodore 64.

I am convinced that the only way to learn to write is by writing and writing and writing. And so I am excited by the development of software to convert the school computer into word processors young writers can handle. These super-typewriters are making students willing to write longer pieces by removing the physical drudgery from revising and recopying. A spelling program will soon be available to operate with these word processors, as programs such as Word Plus and Perfect Speller do with more sophisticated word processing programs used by professional writers. I look forward to the development of supporting programs on style and punctuation that function like Grammatik and Punctuation Style to flag possible errors in the writer's own work.

However, after a year of a conscientious examination of the software available, I reluctantly predict that most of the current educational programs on cassette, cartridge and disk that profess to help students become better writers are destined to sit on a back shelf.

Unfortunately the bulk of the computer programs available are not oriented to the writing process. Instead they steal time from writing and pose a threat to the progress we have been making in the teaching of writing. They consist for the most part of isolated drill and practice or motivating games which purport to have instructional value.

Researchers have been telling us that time spent on theories of grammar, exercises identifying parts of speech, tenses and moods, or on canned workbook lesson on usage does not improve writing. The fact that these lessons are now available on disk does not make them more useful.

Even if we grant that there is a place in the curriculum for drill and practice, and concede that games can motivate, most of the computer programs do not measure up, even the best are mediocre. My conclusions are based on a concentrated examination of much of the current software in the field of writing.

In my examination of software, I followed these rules for locating software.

1. I sat through lengthy publisher demonstrations.
2. I read catalogues and an assortment of articles and advertisements in computer and language arts magazines.
3. I attended computer exhibitions.
4. I took a 10-session course devoted to computer software.
5. I read through evaluation reports by EPIE and MicroSIFT. (No program on writing reviewed by EPIE received an unqualified recommendation.)
6. I visited the computer libraries of teacher colleges.
7. I reviewed software sent to the New York City Board of Education's Computer Center.
8. I asked for recommendations from supervisors and coordinators and teachers.
9. I visited classrooms and sat with youngsters at the computer.

A number of the programs seduce us with attractive graphics and game formats, but such programs either require that we infer instructional goals or do not teach what they profess to teach. Others present barebones drill and practice which trade the freedom of time and place of the printed workbook for an electronic pageturner.

Most suffer from anachronistic or questionable teaching methods, are inappropriate in level and pacing, spend more time on the game "reward" than on instruction or practice, have ineffective feedback and remediation, and only too often have errors or ambiguities in content.

For example, in one program for 5 to 9-year-olds, the children create sentences from a pool of 45 words. Many correct sentences are rejected as wrong because they haven't been programmed. In another English program, high school students underline the third adjective in the sentence. The answer that is accepted as correct neglects to count the demonstrative adjective that precedes the noun.

In a charmingly illustrated spelling program -- and many other programs not nearly so attractive -- students unscramole words as the sole method of learning spelling. A game of concentration with focus on remembering or guessing where matched opposites are positioned is offered as a way of learning antonyms. In an elementary vocabulary program, the task is to name a homonym for a given word but at no point are definitions or context involved. In a writing competency program, designed to tutor students for basic competency examinations, students do no writing. These are a few of the many flaws I found in my working with computer software.

Some of these programs offer "authoring" capabilities which enable the teacher to adapt the content. Unfortunately, the teacher is locked into the programmer's instructional strategies. Instruction in mechanics and usage should follow student writing and teacher diagnosis, wtih the form of remediation based on an analysis of the causes and a knowledge of the student's learning style.

It took us a long time to realize that workbooks available to the teacher should not be permitted to dictate the curriculum. Computers should not dictate curriculum either.

Questions To Ask Before Buying Or Using The Courseware

1. Does the software work with the machine I have available?
2. Does the software do what I want to be done?
   a. Does it have clearly stated objectives and target audience?
   b. Does it cover the same objectives and content I teach in the classroom?
3. Does the software do it better than other methods?
   a. Does it use appropriate methods for the skills or content to be taught or reinforced?
   b. Does it take advantage of graphic and sound possibilities?
   c. Does it use branching to individualize instruction?
4. Are the contents accurate and up-to-date?
   a. Is the software free of error in text and graphics?
   b. Is it free of racial, ethnic, age, sex and other stereotypes?
   c. Does it have an authoring system that allows me to adapt the contents?
5. Is the software easy for the student to use independently?
   a. Are directions for use clear?
   b. Are the definitions and explanations at the student's independent reading level?
   c. Are there enough simple examples?
   d. Does the software allow the student to dictate the pace?
   e. Is the tone of text and graphics appropriate?
6. Are the activities motivating?
   a. Will they challenge but not frustrate?
   b. Is the gaming related to the instructional goals?
7. Is the use of the software worth the investment of student time?
   a. Is the time required worth the outcome?
   b. What proportion of time spent is on gaming?

c. Does it help teacher and student to diagnose student's strengths and weaknesses?

8. Is the software worth the money?

New computer programs are being issued regularly. If any of them can help us to improve writing, I am sure we would be more than happy to welcome them to our classrooms. It is necessary to examine all software closely, however, before investing students' time and school monies.

References

Baum, Joan. "Computers in the English Class. "RESEARCH MONOGRAPH SERIES REPORT NO. 6." Instruction Resource Center, Office of Academic Affairs, The City University of New York. (Oct., 1983)

Billings, Karen, and Stephen Gass. "Adding a Micro to Your School Picture." ELECTRONIC LEARNING. (Jan/Feb. 1981:35-39).

Bushnell, Davis. "Typewriter Bows to Word Processor." THE BOSTON GLOBE. (July 5,1983:46).

Catanzaro, Gloria R. "Evaluation of Educational Software." Inservice Course, Computer and Information Science Unit, New York City Board of Education (Dec., 1983).

Colette, Daiute, et al. "The Computer inthe Writing Class: Problems and Potentials." Paper prepared for presentation at the National Computing Conference, Baltimore, Md. (June, 1983).

"Computer Ethics I: The Software Copying Problem." MICROGRAM. (Dec./Jan. 1984).

COMPUTER LITERACY: ELEMENTARY GRADES. Division of Curriculum and Instruction, New York City Public Schools. (1983).

COMPUTER LITERACY: INTERMEDIATE AND SECONDARY GRADES. Division of Curriculum and Instruction, New York City Public Schools. (1983).

"The Computer As Teacher." CONSUMER REPORTS. (Nov., 1983:614).

"Computers: Perspectives and Prospectives." RESOURCES. Division of Curriculum and Instruction, New York City Public Schools. (Winter/Spring 1983).

Donovan, Ronald John. "Writing Made Easier with Personal Computers." WRITERS' DIGEST (Sept., 1982:33-44).

Duncan, Lois. "Writers at Work." WRITING! (Sept. 1983:27-29).

"EPIE and Consumers Union Micro-Courseware PRO/FILE and Evaluation." Educational Products Information Exchange, Watermill, New York. (Feb., 1984).

Hechinger, Fred M. "Schools Approach to Computers Seen as Wrong." NEW YORK TIMES (July 26, 1983:C6).

Horst, William H. "Help in Finding Software." VIRGINIA ENGLISH BULLETIN. (Winter 1983:26).

Mau, Ernest E. "Synonyms for Word Processing." COMPUTERS AND ELECTRONICS (Oct. 1983).

McWilliams, Peter A. THE WORD PROCESSING BOOK. Fifth Edition. Los Angeles: Prelude Press, 1983.

MECC Microcomputer Software Catalog. Minnesota Educational Computing Consortium, St. Paul. (1983).

"Microsift Courseware Evaluation." Northwest Regional Educational Laboratory, Portland, Oregon.

Pollack, Andrew. "And Now, the New War in Software." THE NEW YORK TIMES. (June 12, 1983:F15).

Sandberg-Diment, Erik. "Educational Programs: Misgivings and Praise." NEW YORK TIMES. (Jan. 4, 1983:C6).

Suttles, A.L. "Computers and Writing, Contemporary Research and Innovative Programs." COMPUTERS, READING AND LANGUAGE ARTS. (Summer, 1983:33-37).

"What Courseware is Available." SCHOOL MICROCOMPUTER BULLETIN. Learning Publications, Bradenston Beach, FL. (Jan., 1984).

"What Should Consumers Be Demanding From Courseware Producers?" EPIEGRAM. Epie Institute, Stony Brook, New York. (Nov. 1982).

"T.E.S.S.: THE EDUCATIONAL SOFTWARE SELECTOR." New York: EPIE Institute/Teachers College Press, 1984.

Whitey, Margaret M. "The Computer and Writing." ENGLISH JOURNAL. (Nov., 1983:24-31).

"Word Processing and Composition: Help or Hindrance?" Idea Exchange, National Council of English Teachers Annual Convention. (1983).

"Wordprocessing Programs." CONSUMER REPORTS. (Oct., 1983:544, Feb., 1984:92).

BUT I DON'T EVEN LIKE COMPUTERS!

Jacqueline L. Marino

You are surrounded by computer freaks. Your students are talking about cursors and bugs and booting it up. Each month another educational journal reminds you that by 1988 there will be two million microcomputers in the nation's public schools. Your spouse, daughter, cousin, doctor and plumber are all taking courses in programming. And now your principal has announced that you, lucky soul, will have the use of several microcomputers in your language arts classroom next year.

"But I don't even like computers!" you say. You are a warm, humanistic teacher and computers are cold and unfeeling. All the software you've seen looks like the workbooks you gave up years ago in favor of more productive tasks. Your classroom is a hub of activity and discussion, where students are involved in various stages of the writing process, carry out group interdisciplinary projects and read a quantity of books. You recall the controlled reader and the language master and the tachistoscope, gifts of a previous high-tech era, now consigned to the top shelf in the storage room. But you are a flexible, creative teacher. After all, you use cuisinaire rods in math class, and were first in the school to teach public speaking with the video recorder. One hundred thousand school districts can't be wrong, but . . . of what possible use is a couple of microcomputers in a language-rich, interactive, process-oriented classroom? And how does someone who doesn't even like computers begin to evaluate their possibilities?

But take heart, for you are better prepared than you think. As a teacher, you are skilled in bringing together the learner and what is to be learned. As a language arts teacher, you know how to teach reading and writing and use certain

criteria for selecting your tools. As a language arts teacher who believes in whole-language learning, you bring a thorough knowledge of contemporary research to the evaluation process.

You know, for example, that current theory stresses reading and writing as interactive, multi-dimensional processes. It is inappropriate, then, to devote instructional time to isolated skills just because those skills are easy to computer-ize.

You know that any instructional tool should complement your course of study. If that is not true of your software, then it doesn't matter how creative the design or how clever the graphics.

You know, too, that there is no substitute for a good teacher. Unless your software saves time, makes a hard task easier, or serves more students, then it can't do the job as well as you can.

You know that computers were designed to let the user ask the questions. It doesn't make sense, then, to invest in software that stresses only one right answer.

And finally, you know that if computers are the wave of the future, then we shouldn't be using them to mirror the past. Electronic flashcards or automatic page turners won't enhance your teaching.

The best place to look for evaluation criteria is in a statement of program goals. This paper is an effort to look at some current software offerings in light of just such a statement: the National Council of Teachers of English document, "Essentials of English," As John C. Maxwell stated when the document was released, "it will be more helpful in stating what English is for those who have forgotten or need to be reminded." As we are bombarded with computer programs on capitalization, punctuation, and syllabication, it is critical that we keep in mind what English is.

Software for Writing Instruction

According to "Essentials of English," writing instruction should help students:

> recognize that writing is a way to learn and develop personally as well as a way to communicate with others;
>
> learn ways to generate ideas for writing, select and arrange those ideas, find appropriate modes for expressing them, and evaluate and revise the written product;
>
> recognize that precision in punctuation, capitalization spelling and other manuscript conventions is a part of the total effectiveness of writing.

Probably the most promising and useful application of computer technology to the language arts teacher is word processing, a program which facilitates the writing and editing of text. Word processing will not fulfill the NCTE's writing essentials, but it will go a long way toward making the mechanics of writing easier. Notes can be recorded at the keyboard and fleshed out later. Rough drafts can be rearranged, corrected at the word, sentence and paragraph levels and printed out. Deletions, insertions and transpositions can be accomplished by a mere key stroke. Formats can be tried out, discarded, rearranged and printed out in seconds without re-typing a word. Even the simplest word processing programs make revision easier. In several studies using the Bank Street Writing with young children, Daiute (1983) found that users became more prolific and made more corrections, both with word processing and on subsequent paper-and-pen writing assignments.

Some word processing programs match spelling with a built-in dictionary or provide a limited analysis of style. Length and type of sentences, a count of vague or abstract words, and a comparison of paragraph lengths are indicated. It is then left to the writer to decide if changes are necessary.

Soon to enter the software market are more interactive programs which can assist writers during the pre-writing phase. Schwartz (1982) has devised a two-part Apple program, in which students first respond to questions about a literary topic.

For example, "What does _____ do that shows that _____ is _____?" "What does _____ say that shows that _____ is _____?" "How do other characters react to _____ which shows that _____ is _____?" In part two, students use the computer to comment on each others' ideas and use the comments they receive to rework their own essays. This response network is not unlike a regular class discussion, but the anonymity achieved by using a pseudonym may free students to be more responsive at the keyboard.

Essaywriter (Wresch, 1982) is another pre-writing aid which helps students select and limit a topic by asking a series of guiding questions. It includes a stylistic analyzer and spelling check, and runs on an Apple II microcomputer.

Most pre-writing programs raise to the conscious level what writers already know about their topics and elicit those ideas. The newest examples, like Think Tank, help to organize those ideas in outline form. This program allows a student, using logically-labeled commands, to list thoughts as they occur, interweaving notes and full-developed statements, imposing order as it evolves. With the program's ability to move from minor points to major overview, the student can develop, re-order, or eliminate information at any point in the composing process.

WANDAH, an acronym for "Writer's Aid and Author's Helper," is an ambitious project developed by Michael Cohen and his colleagues at UCLA. Programmed for the IBM-PC, WANDAH combines word processing with strategies for planning, reviewing, and revising. It includes such features as invisible writing, with directions to summarize after every 150 words; "nutshelling," instructions to give the title, audience and rhetorical purpose "in a nutshell;" a split screen capability which displays notes and text simultaneously; and files for teacher comments, which allows the reader to restate the writer's message and refer the writer to other program aids. Preliminary piloting by students at UCLA has resulted in substantive revisions, more collaborative writing and a "remarkable class spirit," according to Gerrard (1984).

As word processing programs continue to improve in their ability to facilitate writing, the question "Should I use a word-processor?" will clearly be answered in the affirmative. For a helpful list of procedures to follow in selecting a word-processing program, see Knapp's (1984) "Buyer's Guide to Word Processors." To help with the logistics of incorporating word processing in the classroom, Boudrot (1983) offers eight easy steps for getting started, including the importance of teacher preparation, the training of class leaders and hints for managing the classroom efficiently.

Software for Reading Instruction

According to "Essentials of English" reading instruction should help students:

> learn from the very beginning to approach reading as a search for meaning;
>
> develop the necessary reading skills to comprehend material appearing in a variety of forms;
>
> learn to judge literature critically on the basis of personal response and literary quality.

Unfortunately, most reading software falls far short of meeting any of these goals, reproducing instead "the familiar phonics workbook or its counterpart, the basal reader, on the video screen" (Wheeler, 1983). Few programs have been successful in capturing the interactive nature of the reading process, helping students to predict or confirm hypotheses as they read. As described by Wheeler, The Puzzler is just such a program. Based on the psycho-linguistic theories of Kenneth and Yetta Goodman, Carolyn Burke and others, the program disk contains five stories, appropriate for grades two through six. each story unfolds on the screen, readers are asked to make predictions at key points, then are given further opportunities to confirm or reject their predictions and add new ones. The reader's purpose is not to find the right answer, but to use prior knowledge to generate all plausible responses. A second feature of the program allows students to create stories for others to read. Wheeler points out that this process not only extends

the usefulness of the program, but also "reinforces the critical link between reading and writing."

In addition to providing a lucid description of The Puzzler, Wheeler's article also lists eight criteria for "special-purpose" reading software. These criteria should be kept in mind when developing or evaluating future offerings, and are well worth repeating here:

> The program should be based on a reading theory that is clearly stated in the documentation.
>
> The program should help students to develop effective reading strategies.
>
> The program should encourage the expression of ideas.
>
> Reading selections should be taken from, or be indicative of, quality children's literature.
>
> The program should allow both teachers and students to enter original work.
>
> It should be possible for students to use the program without relying on the manual.
>
> Written material should assist the teacher in helping students transfer new strategies to everyday reading.
>
> The program should not duplicate what can be accomplished as effectively with teachers, peers, books or paper materials.

Software for Language Instruction

NCTE's Essentials of English reminds us that language instruction should help students:

> recognize language as a powerful tool for thinking and learning;
>
> become aware of how grammar represents the orderliness of language and makes meaningful communication possible;
>
> recognize how context - topic, purpose, audience - influences the structure and use of language

Again, software which specifically addresses these goals has yet to be developed. However, some otherwise conventional programs may add spark and zest to the language arts classroom if they encourage language play or peer interaction.

Seymour Papert (1984) states that the "scandal" of education is that whenever you teach a child something, you deprive the child of the possibility of discovering it. Programs which promote language play come close to Papert's vision of a computer as "a mudpie," performing uncritically and flexibly as students explore and manipulate the many patterns and uses of language.

In addition to flexibility, Fisher (1984) speaks optimistically of the social effects of computers, stating that computer users develop a most positive self-image and achieve more productive interaction with their peers. In fact, Chomsky's (1984) criteria for evaluating the effectiveness of software includes two questions which acknowledge this capability: "Is the emphasis on thinking rather than on repetition?" and "Does the program involve two or more students?"

In the language arts classroom, the strategy of using language experience stories takes on a new dimension as several students work at a single station, dictating, discussing, revising, and sharing their creations. Later, those same stories can be used by other classes to reinforce comprehension skills (Jacobsen, 1978). Individual stories can be used to elicit summaries or main idea statements. Sentences can be rearranged for practice in sequence or use of logical connectives. Or several stories with a common theme can be used to generate activities in classification or categorization.

Software programs which provide opportunities for using language in an interactive setting include Compupoem (Marcus, 1983), and Shape and Motion Poetry (Jacobsen, 1983). The former helps students generate brief poems based on users' knowledge of the parts of speech. The latter is a simple program which allows users to create their own shape-poems on the screen. Effectiveness of these programs would be enhanced by peer interaction.

Programs such as Riddle Me This, Missing Links, and Hangman could probably be effective as paper and pencil tasks. As software, they lend themselves easily to

competitive use as students challenge each other to look closely at language patterns at the letter, word, or sentence level. Riddle Me This uses a riddle-game format to provide practice in use of homonyms, contractions and possessives. Missing Links requires students to replace missing letters in passages from children's literature. Players select a passage, a format for missing letters (ranging from initial consonants to only blanks and punctuation!) and proceed to use various linguistic clues to complete the passage. O'Brien (1983) calls this "software of the second-and-a-half kind." More imaginative than drill-and-practice programs but still constrained by program rules, their real value lies in the students' discussion as they seek to justify their responses to each other.

Conclusion

So maybe you don't really like computers, and you can't imagine curling up with a good floppy disk at the end of the day. But like the other tools of the classroom - your pencils, paper, books, and chalkboard - your computer has a unique role to play. Given your own certainty of what English is, and the right software, the computer will support your creative teaching and your students' creative learning.

REFERENCES

Boudrot, T. "Writing Skills and Word Processing: 8 Easy Steps to Get You Started." Teaching and Computers, Spring 1983, 28-30.

Chomsky, C. "Finding the Best Language Arts Software," Classroom Computer Learning, January 1984, 61-63.

Daiute C. "The Word Processor and Revision Strategies." College Composition and Communication 34, May 1983, 149-155.

Fisher, G. "The Social Effects of Computers in Education." Electronic Learning, March 1984, 26-28.

Gerrard, L. "Using WANDAH in the Writing Classroom: A Teacher's View." Paper presented at the Conference on College Composition and Communication, New York City, March 1984.

Hangman. Pet (32K). ESU #3, 4224 S. 133, Omaha, NB 68137.

Jacobsen, J. "Hey, Billy Wrote This!" Unpublished paper, State University of New York at Albany, 1978.

Jacobsen, J. Shape and Motion Poetry. TRS 80 I and III. Learning Packages 19 Rosewood Drive, Clifton Park, NY 12065.

Knapp, L. "Buyer's Guide to Word Processors." Electronic Learning, March 1984 54-58.

Marcus, S. Compupoem. Apple (48K). SCWrip, English Department, University of California, Santa Barbara, CA 93106.

Missing Links. Apple II, Atari, TRS 80 III (48K), IBM PC (64K). Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570.

O'Brien, T. "Wasting New Technology on the Same Old Curriculum." Classroom Computer Learning, November 1983, 27-30.

Papert, S. "Computer as Mudpie." Classroom Computer Learning, January 1984, 37-40.

Riddle Me This. Data Command. TRS 80 Models I and III, Apple II (48K).

Schwartz, H. "A Computer Program for Invention and Feedback." Paper presented at the Conference on College Composition and Communication, San Francisco, March 1982 (ED 214 177).

WANDAH. IBM PC (128K). Department of Psychology, UCLA, Los Angeles, California 90024.

Wheller, F. "The Puzzler: An Answer to the Reading Middle?" Classroom Computer Learning, November 1983, 45-51.

Wresch, W. "Prewriting, Writing and Editing by Computer." Paper presented at the annual meeting of the Conference on College Composition and Communication, San Francisco, CA, 1982. (ED 213045)

COMPUTER USES: PROFESSIONAL AND PERSONAL

COMPUTERS AND ENGLISH

Grace C. Walter

Computers and technology seem the antithesis of Shakespeare, Chaucer, intimations of mortality, and thesis statements. In the world outside the English classroom, however, the address labels on our magazines, beeps from a cash register and video arcades all remind us that computers and technology surround us every day. Generally, though, we teachers of English have been reluctant to allow computers and technology into our classrooms, because we have seen that devices which in the past were heralded as ushering in a new age have, in fact, turned out to be disappointing. Computers, however, are vastly different from these other "innovations." Computers cannot do anything without an intelligent being to either program them or to interact with them. They are not passive, but active. In fact, computers are particularly suited to take the drudgery out of routine tasks and to inspire creativity. In short, computers do have a place in the English program; I would like to share some of the ways the English teachers and I use them.

First of all, the computer provides welcome assistance to the busy English department head. Since our department head typist does not take shorthand, I must write out letters, memos, reports, and write-ups of classroom visits. With word processing (Apple Writer II or Bank Street Writer), I compose and edit necessary correspondence and provide an easily-read print-out for our typist to transfer to school letterhead paper. In fact, rather than retype write-ups of classroom observations, our typist merely cuts and pastes my "word-processed" anecdotal account to the school form and photocopies the whole report. For future reference, I save on disk important position papers, reports, tenure and hiring/firing recommendations. Using the computer simplifies my work as I can change,

move, delete, and add words, sentences, and paragraphs easily and quickly. And our typist is pleased to have a legible, clean copy from which to type correspondence.

Yet another use of the computer for the English department head is inventory control. Books, obviously, are the backbone of any English program. For many years, I struggled with the problem of keeping teachers informed about current book prices (for assessing book fines for lost, damaged books and for budget and ordering), storage locations of books, and numbers for each title. Since we own 186 different titles, an accurate inventory would be invaluable. Eureka! Once again, the computer comes to the rescue. We purchased a data base system (PFS: File and PFS: Report, Software Publishing Corporation). The tedious part was entering in the computer the data about our books; now with the completion of that job, adding new titles, current prices, and numbers is easy. For all of our books, each teacher has a printout which includes the following information: title, author, publisher, course title, storage location, price number. As prices or numbers of books change, I update the information; at the end of the year, we bring a computer to the English area, assign one teacher to input the data from other teachers who take the inventory, and print out an up to date report on our books. During the summer as I check in new titles, I add these new books to our inventory. Before school begins in September, I print out an accurate, current accounting for each teacher to have and use. What used to be a nightmare of chaos and inaccuracy is now, thanks to the computer, organized, accurate, and, most important of all, easily usable by our teachers.

Another administrative nightmare for English department heads in New York State is the recording and reporting of Regents Competency Reading and Writing Test results. The question: how best to collect and disseminate the necessary information? I took our concerns to one of our computer programming teachers,

who has assigned the problem to two students. Right now, they are writing a program which will report the following information: date of examination; student name; student grade level; answer pad number; scores on the business letter, report, persuasive essay; mean of these three scores; reading test score; writing tests scored 59 or less (to assist us in pulling out the papers NOT to be sent to Albany for re-rating). We hope to use this computer program for the June '84 administration of the RCT's; smaller numbers of students and less time pressure should make the debugging of the program easier than it would be in January with larger numbers of students.

But computers ease the workload of the classroom teacher of English, too. Many school districts are members of MECC (Minnesota Educational Computing Consortium); their teacher utility programs are excellent and allow the creative teacher of English, for example, to construct crossword puzzles and word searches using vocabulary words for a particular novel, play, or short story. The MECC grades management program, which has just been issued, is user friendly and easily learned. For about a year, I have been using an adaptation of a grades management program from Creative Computing; this particular program conforms to the reporting requirements of my school and is, therefore, very convenient. At any time during the quarter, I can ascertain the averages of my students; this is especially helpful since I am teaching only seniors whose progress needs constant monitoring. With a grades management program, I can easily weigh assignments and as long as I accurately input the grades, I don't have to worry about arithmetic errors in figuring averages.

Beyond teacher utility programs lies the world of software intended for use by students in the English program. Here the potential is enormous, but so far, I have been somewhat disappointed. For example, I believe in sentence combining for encouraging syntactic fluency; but the programs I have seen so far don't

measure up to those already on the market in textbooks. Another disappointing area is that of verbal preparation for the SAT's; one vacation I spent two or three days going through one particular program and was appalled at the poor quality of test construction. My extensive experience writing Regents examination items has made me painfully aware of what does and does not make a good test item; therefore, I would hesitate to recommend any SAT preparation program without first previewing it. Although the drill and practice mode may be useful to a limited extent in the English program, I tend to regard such programs with skepticism; textbooks can accomplish the same ends and for less money. In the future, however, more sophisticated programs which require simulations may become available and may be worth considering by English departments.

On the other hand, a good word-processing program, such as Bank Street Writer (which is being used for writing this article) may enhance the teaching of composition. A cautionary note is in order. As Robert Shostak notes, unless teachers understand the process of writing and how to integrate technology into writing programs, computer-assisted composition instruction will NOT be a panacea.[1]

A successful example of such integration, however, is the use of word processing in our senior high remedial writing program. Students preparing to take the RCT in Writing practice extensively composing and revising the business letter, report, and persuasive essay. A finished copy is then evaluated. One advantage of this approach is the computer's infinite patience, thus allowing the student to move at his/her own pace. The cursor will blink forever and never say, "Hurry up!" Another important advantage is that the student can SEE the construction of sentences and paragraphs; editing and revising thus become easier than with pencil and paper. For example, if the student has misspelled "receive," he/she can use the FIND command to locate all of the misspelled "receive's," and easily correct them.

Moving or deleting blocks of text is also easy. The commands are always at the top of the video display, thus minimizing the memorization necessary to use the program. In other words, the Bank Street Writer is, in computerese, "user friendly."

Our teachers have discovered that student attitude toward remediation has significantly improved; usually, older students in need of remediation are embarrassed and hostile, but being able to use the computer to compose is a morale booster. These students take pride in their work, enjoying the clean, error-free text they have produced. After observing these students, I would like to do a controlled study with average and above-average students to determine if students would spend more time on the editing process, thus producing a more polished product, if they used word processing; my hypothesis is that they would. The obstacle to such a study is MONEY: we need at least 25 computers; at present we have one for our remedial program. The other school computers are used by the computer programming classes.

Until the millenium of enough computers in English classes, teachers of English can ease their workload by using the teacher utility programs for grades, crossword puzzles, etc. More importantly, they can use a word processor instead of a typewriter or a pen and ditto master. For example, I have over the past three years put nearly all of my tests and quizzes in the computer; when I discover that a particular item does not test well, or if I have changed the content, concepts, or emphasis since I last taught a particular unit, I can easily revise the item(s) without having to retype the entire test or quiz. Obviously, this is a tremendous time-saver and improves the overall quality of testing.

I also use word processing for other teaching aids, such as vocabulary lists and directed reading and study guides for novels, plays, essays and short stories. Again, the advantage of having these materials saved on disk is that revisions and improvements are quick and easy.

But for me, the best use of word processing in teaching English is in writing models for students to use in composition lessons. Particularly with my slow learners, a skeleton essay with the three part paragraphs clearly arranged helps to overcome the, "How do I get started?" syndrome. Also, the concept of thesis extraction is easier for my college-bound students to grasp if they can see it applied in a thesis essay I have written as a model. Providing students with examples of composition not only helps students do the assignments, but also improves my credibility as a teacher. Students know that I also can write! Although I did do some model writing before Ada* came to live at our house, I find that I do much more now because the computer makes the task so easy. The word processor has definitely enhanced my teaching.

So what of the future of computers in the English program? Certainly, data base programs for inventory control and word processing to assist both teachers and students are here to stay. Other programs touching other areas are already on the market, and, if carefully previewed and tailored to local needs can enrich the English program; still other programs will appear in the future. At this point, computer-assisted composition instruction is a "promising practice" which merits careful evaluation.[2] Whether or not teachers of English need to know computer programming is an open question. The important point, however, is that teachers should be at least familiar with the components of a computer set-up, know how to operate it, and most important, learn how to use a word processing program. After all, we have been in the word processing business ever since the teaching of English became a distinct discipline. The only difference today is that we have a powerful tool to help us with that word processing, the computer. Let's use it! (Thank you, Ada! Yes, now you can take a nap.)

REFERENCES

[1]Shostak, Robert. "Computer-Assisted Composition Instruction: Some Promising Practices." The Best of Pipeline, 8, No. 2 (Fall 1983), 19-20.

[2]Shostak, p. 20.

*Ada B(yte) O'Apple, The name of my computer.

HOW REALLY TO USE A COMPUTER AS WORD PROCESSOR

Doris Quick

I first considered buying a computer to use as a word processor a little more than a year ago when I was beginning earnest work on my doctoral dissertation. One of the first problems I encountered was finding a typist who could transcribe several hours of tape recorded interviews I had conducted with students about their writing. The transcription had to be absolutely accurate because it was to become a source of data for me. I was interviewing my third typist. The first had quit in tears because she couldn't do the transcription. The second tried mightily, but she was hearing just enough specialized vocabulary so that she wasn't able to transcribe accurately. The third thought she could do the job, but she required a fancy electric typewriter, a transcribing machine that I would need to rent, and her price was, how shall I say?, beyond my means. Realizing that I was going to have to do my own work, painful as it was, I went about locating a good electric typewriter and a transcribing machine to rent and sat down to work.

My journal entry for that time period makes the following notation:

"I am discovering that the right equipment makes all the difference. I like the way this typed copy looks, and I find that is important to me. I like the correction ribbon feature, but that wouldn't be very useful to me in typing dittoes. The height of the table and chair makes a difference, too, if I'm going to be working for hours at a stretch. It also seems important that I can type fast and easily at the keyboard if I am going to compose at the typewriter. Am I thinking about a computer?"

Once more, my journal turned out to be a surprising source of truth, because I was indeed thinking about a computer. For the next few days, I weighed the idea and conjured up other ways a computer would be useful to me: I'd be able to analyze my own data, I'd be able to type my own dissertation, I'd be able to do my own charts and graphs, I'd be able to learn word processing so I could teach it to my students. In short time, the rationalization was complete, and I set out to choose computer, screen, disk drives, and a printer. I'll tell you about my search and what I chose.

I'm not very knowledegable about machines, and I'm not a very smart consumer. I did not conduct thorough research into the computer market; instead I talked to friends. My brother and sister-in-law, both teachers, researchers, and writers, own two (not one, but two) Apple II's and like them, find they are doing fascinating and intriguing tasks with them, much like the work I hoped a computer would do for me: simplify writing tasks, make charts and graphs, analyze data, simplify teaching tasks, simplify personal bookkeeping and writing. Then, I talked to the computer specialist at our local BOCES who pointed out that, at the time I was buying a computer (in the summer of '82), more educational software was available for the Apple than for any other computer. That situation may have changed since then. In any case, I decided on an Apple II with 48 K, a monitor that displays the type in green because it seems easier to read, two disk drives because I had learned that the casette tapes were too slow to load a program, and an Epson Mx 80 printer. So far, the equipment I chose has served me well, but the market changes almost daily, so if you are thinking of buying, you need to decide what work you want a computer to do and what brands are likely to do your job for you. Since I selected my computer, Franklin has come out with a computer that is compatible with Apple software, IBM has brought out a product, and some of my colleagues love their Radio Shack computers. It's a lot like buying a car; you have to decide what YOU like, and I would not try to influence you.

The next tasks were to select and to learn a word processing program. Let me assure you that you do not need to know math or programming in order to use your computer as a word processor. While there are probably lots of good reasons for being knowledgeable about math and programming, this isn't one of them. Actually, I had taken an inservice course in computers once, or rather, I had taken part of one. I dropped out about half-way through when the math became overwhelming and our assignment was to work through a program that would allow us to write multiple copies of business letters. You know the kind of letter you get from magazines trying to lure you into contests? "Dear Mrs. Quick, Some of your neighbors in Clifton Park..." I'm supposed to believe that some typist knows me and typed a personal letter. I know better than that, and I know I don't need to write those kinds of letters, so I dropped the course.

I tried the word processing program called Apple Writer that came with my computer, but I didn't like it. For one thing, it did not display capital letters on the screen, and I just could not make the mental adjustment necessary to believe that a light shining behind a lower case letter made it a capital. Since then, I have discovered that some simple tinkering will allow the display of capital letters on the screen, and I have found Apple Writer useful for students, but at first I didn't take to it.

Then, a friend suggested that Superscribe would do everything I wanted so I tried it. Here are some features I found attractive: 1) it displays upper and lower case on the screen, 2) it displays an 80 column or character text on the screen so what you see on the screen is what you get from the printer, 3) it underlines and makes superscripts (little numbers up in the air for footnotes), 4) it changes, inserts, and deletes text when you are ready for revision, 5) it moves whole sections of text around. And, oh yes, it will run off multiple copies of business letters that look personalized, so I was right not to try to work through that program in my inservice course.

One question I am frequently asked is: how long did it take you to learn word processing? My answer has to be "a long time." By now, it was September and school had started, so that any learning I did had to be after school when I was tired anyway. I discovered that you have to be sharp and attentive to learn anything about computers. They are mercilessly relentless in their inability to tolerate error on the part of the user.

Let me tell you about the great comma caper. I was trying to type into the computer the introduction to my dissertation just to get some practice. About the first thing to do is name the file so that the computer knows where to find your text when you want to work on it later. It's like putting a label on a file folder so you can locate it later. I named my introduction "Introduction". (I told you I'm not sophisticated about machines). Since I was using two disk drives, it was necessary to tell the computer my text was stored in the second disk drive, so I named my file, "Introduction,d2".

Did you notice there is no space after the comma up there? Well, I didn't. For what seemed like weeks, my computer refused to get my text back for me to work on. It kept telling me, "Slot/drive out of range." I didn't know what that meant, so I spent a lot of time searching through the instruction manual (called the documentation) and all I discovered was that the drive had to be either 1 or 2. Well, it was I thought. It was 2. Finally, in desperation, I asked my friendly computer expert from BOCES to come to the house to see what was wrong with my computer. It only took him about two seconds to see that I was spacing before the comma and the computer could not decipher that as an instruction to find my text in drive 2. The lesson I learned is that the computer is really dumb, and that one must speak to it very carefully. It does not have higher order thinking skills like inferencing in spite of all this heavy duty talk of artificial intelligence.

Lest you become discouraged about trying word processing, however, let me assure you that some of my colleagues, many of whom pride themselves on being non-technical, are picking up Ace Writer skills very quickly- in one or two thirty minute sessions under the direction of our librarian who has taught herself three or four word processing programs. The teachers find Ace Writer very satisfactory for the day-to-day typing chores we do. They can produce perfect dittoes and tests, for instance.

Although my instincts tell me everyone has to make his or her own mistakes and that you never make the same mistake twice, I'll share other sad stories with you in hopes that you will be spared some grief. I lost a whole chapter once. I had worked an entire day writing when my husband came home at about five o'clock wanting to run an errand. Tired, I stood up, turned off my computer, and screamed in dismay, "I can't believe I did that!" What I had done, of course, was lose an entire day's work because I did not save my text to the disk before I turned off the juice to the machine. Lesson learned: save the text frequently, think before you make irrevocable moves like turning everything off, think especially hard when you are tired.

I've learned to be very impatient with most computer documentation. The instruction manuals usually come in two parts, a tutorial that you are supposed to work through in order to learn the progam and an index of terms and commands and such. In my experience, I work through about half or less of the tutorial and then feel as though I am free of it and anxious to get on with the work. Here's where the frustration comes in. I have yet to find computer documentation that is well indexed. Lesson: study the documentation before you buy a program. If it seems unreadable, unnecessarily long, or poorly indexed, the frustration you experience may outweigh the advantages of even a very good program. Recent programs are attempting to put all of the instructions right on the screen so a user is free of all

documentation. Lesson: to the extent that is possible, the program is probably more usable and more easily learned.

I've learned that you're going to chew up a lot of paper while you are learning. My personal writing process involves composing right at the keyboard, saving short sections of text frequently, printing out parts, editing and revising small sections on paper, then editing on the computer, writing more, and repeating the process. I've learned not to pencil draft first, but to make short pre-writing notes to myself and then just go with it at the keyboard. I've learned not to edit too soon, but to relax and let the words sort of flow untended until there is a natural stopping place. Then I go back and read the text on the screen carefuly and make the kinds of editing changes at the word level that seem absolutely necessary. Then I print out a hard copy and make more major revisions like moving text around, adding elaboration or example, trying to refine the stylistic components. Finally, I go back and write some more and repeat the process. As I said, I use a lot of paper. But it's fun. The revising and editing are not tedious, and I find I write more than I had ever written before word processing. Lesson: put your ecological conscience behind you and use the paper you need to.

Because revising and editing are fairly easy and sort of fun, the temptation to keep on editing and editing forever exists. I have learned that no text is ever perfect. At some time, one stops and decides that it is good enough. Lesson: learn to stop editing. Linda Flower calls this satisficing, but it's a difficult lesson to learn.

It's also easy to become captivated with the moveability of text and to make really stupid errors while you're freewheeling through your text. For example, my dissertation director commented on one paragraph quite tactfully by saying, "I thought you were going to talk about the fourth grader's responses here." Rereading, I saw that that was a logical assumption on his part because that's what

the first sentence in the paragraph said I was going to talk about. But I didn't. What I had done was move some text to the wrong place, but because it seemed in some ways to make sense, I never noticed my mistake until a careful reader called it to my attention. Lesson: learn to proofread carefully, carefully. Typed text looks so authoritative there on the page that it's easy to overlook really dumb mistakes.

Those are the horror stories. Is there good news? Indeed. It is in the revising and editing part of the writing process that a computer is invaluable. Because the writer is relieved of the tedium of recopying or retyping large chunks of text, revision can be accomplished quickly and painlessly. At one point, I was achieving a two-day turnaround time with my dissertation director. That is, I was able to return a chapter with revisions two days after he suggested them to me. Of course, I must give credit, not to my computer, but to the wonderful conscientiousness of my director, Lee Odell, who was able to read and return chapters in such astonishing time.

The conclusion to this narrative is that I did finish my dissertation using a computer in less than one year after I began writing and it was done while I was teaching full time. I was able to do most (but not all) of my graphs and statistics on the computer as well.

What other uses for the computer have I discovered? I have put my Christmas card list in the computer's memory, and I am able to print labels, thus taking the tedium out of that boring task. However, one of my friends said she almost threw my card out unopened thinking it was junk mail. I'm not sure about the etiquette of having my personal mail labeled. Is it tacky? Maybe, but I justify my practice by telling myself it leaves me more time to write personal messages. I also have labels available for use with a group of 100 teachers that I correspond with regularly. In addition, I am using Visifile, a record-keeping program, to keep

track of expenses associated with some income property as well as the treasurer's records of the New York State English Council. Too, I do all of the typing associated with teaching on my computer and find it much easier to save a disc than a ditto. Currently, I am experimenting with a Minnesota Educational Computer Consortium program that allows me to keep my classlists and grades calculated and up to date. I must confess that this semester is the first time I have ever had an accurately alphabetized class list in some 22 years of teaching. Finally, I have my resume stored on a disc and find it easy to keep it current. I'm investigating a good way to keep our household accounts keyed to income tax categories to save some confusion at income tax time. However, I do not have my recipes on disks and I do not think it would be convenient to do so since I'd need to print in my office and I tend to cook in my kitchen. I've changed my mind about other things, though.

What are the implications of word processing for teachers? I believe computers are here to stay, and we non-technical types had better get in touch with the technology. Just as teachers who write are better writing teachers, probably teachers who use word processing as part of their own writing process are likely to teach word processing sensibly.

For example, when I decided to teach my Journalism students the fundamentals of word processing, I identified two students who were already familiar with word processing. One had written his own word processing program, and one regularly writes his papers using Apple Writer II. I had these two teach the class. We taught a few basic commands: how to set the margins, how to move the cursor, how to correct mistakes, how to move the text around, how to save, how to print. The students adopted perfect vocabulary, describing how the cursor eats the text (deletes it) and spits it out (recreates text). Then students were asked to produce a page of perfect text. We told them they could write about anything, but they

should compose at the keyboard. Using five Franklins, each with single disk drives, one printer, one copy of Apple Writer, and five blank data disks, it took one week of classtime to provide every student with some keyboard time. Then students were instructed to use the computer lab during their study halls and free time to produce a page of text. The students, mostly eleventh and twelfth graders of average and better than average ability, took to word processing like ducks to water and had no trouble and no grumbling about producing a page of text. My aim was to familiarize them with the processor so they would feel comfortable about trying it on their own. Some of my colleagues have suggested that this is not the domain of the English department, but I'm certain that one week of classtime spent in hands-on activity is worth four or more weeks of watching a screen while someone else types or of doing workbook exercises in programming.

Another student of mine has demonstrated another use of the home computer. Eric is a bright student and good writer who seems to have a serious spelling problem that detracts from the quality of his written work. He has learned to use a dictionary program on his home computer that identifies non-English words and asks him if he wants to correct them. I like this program because Eric does the work, and the corrected papers show Eric's thinking process in its real light instead of being obscured by errors. Is this cheating? Not in this age, it's not.

My dissertation director's example suggests the best kinds of comments to make to students to encourage revision on a computer. I mark places in student texts where I'd like to know more, where I'm not absolutely certain I follow their line of reasoning, where I need elaboration or example. It's quite simple for students to take these kinds of marginal comments and to revise using the word processor to add or delete, to move text around, to add a generalizing sentence or a transition to clear up confusion. This seems like the work "real" writers do.

The final implication of word processing for teaching lies in refining the ways the computer can help students find their way through the writing process. As I study my own writing process, I find that any pre-writing I do is still in my head or I may use a pencil and paper to jot list some ideas just as I always have. I have read about computer programs that are designed to lead students through a series of questions designed to stimulate invention and discovery, such as one designed by Hugh Burns and George Culp, but I have not previewed it. In any case, these are the ways the computer fits into pre-writing at least for me.

When it comes to drafting, it seems clear that students must be taught to compose at the keyboard if maximum efficiency is to be realized from the machine. This means that typing and keyboarding skills must be taught to very young children if writers are not to be doomed to hunt-and-peck forever. I leave it to my elementary colleagues to debate the exact age for this instruction, but I note that the New York Times reported on kindergarteners typing full pages of text.

It is in the re-drafting that the word processor is amazing. There are programs that will point out spelling errors, suggest elimination of repetition, encourage variety of sentence structure patterns. But even without the software, writers will find it quite within the realm of possibility to produce perfect typed text. They will find it easy to insert, delete, and change, letters, words, and whole passages making stylistic experimentation a real possibility.

As for evaluation, it is quite easy to print up multiple copies of text to be shared with peers or other critics in peer evaluation groups. Or, if the teacher prefers, students may leave their text on the screen and other students can be invited to comment using Peter Elbow-like prompts.

Finally, I have heard about the ultimate in writing for real audiences. A school in San Diego has adopted a school in Alaska. Students are pen-pals writing their letters on computer terminals which send the messages back and forth at

night when the rates are lower. Imagine having your personal letters answered overnight!

I find I am becoming self-conscious about when to end this text. My temptation is to add some more, to edit a little bit. But I think I'll take my own and Linda Flower's advice and satisfice. I will not edit this again-even though it would be easy and fun.

Computers and the Student: From Games to Writing

Timothy Chew

"COMPUTERS" — for many people this one little word invokes an incredible suppressed fear. It's a fear of the unknown and a fear of the often difficult and laborious task of understanding the computer. For me it opened a new and exciting world, a place where I could create and let my imagination go. Everyday trivial tasks became interesting and exciting. It was something which challenged me, yet, with hard work and practice, something which I could ultimately master. It was a world of color, of sound, of logic and of fun. A world with set backs and rewards. A world of hardship yet one of accomplished ease. This was my world, just me and my computer.

I was first introduced to computers in tenth grade. I took a scheduled ten week course at school. It was entitled, Intro to Basic, and that's exactly what it was, very basic and very boring. Like any other students at that time, I was interested in one thing and one thing only, games. Why did I need to know about For-Next loops or subroutines and arrays? When do we get to the games? Well, I soon found out playing games was fun but making your own was even better. I guess that's the dream of everyone who considers himself a programmer, to make the perfect game. And of course I had to at least learn basic before I considered programming my own game. So quickly I set upon making the best game in the whole world.

Of course my stardom was short-lived. There isn't too much exciting in the way of games that you can make with a few print statements and "goto's," which was about the extent of what I'd learned in my basic course. Depressed and unhappy, I was about ready to scrap the entire project. But then I met a kid everyone in the Math department lovingly called Fro due to his afro-like hairdo.

Fro was the quiet type. He was a hacker, as people who sit behind their keyboards for hours if undisturbed, are commonly called. I really don't know why he took to me. Often he would refuse to help other rookies in the computing field. But Fro was a storehouse of knowledge; he was expert in his field, or so I thought at the time. Slowly and almost without my knowing it he began to pass this knowledge on to me. He became my teacher, showing and teaching me the "ins" and "outs" of peeks and pokes, an almost necessity for my perfect game. He taught me many and varied programming techniques. With his help I finally finished my game.

The object of my game was to shoot randomly appearing blotches without being landed upon. Although my game was by no means marketable, it was more or less entertaining and had imparted to me a sense of accomplishment. Now that my game was finished I had but one small problem: how to play it? We, the students, weren't allowed to play games on school computers. It was okay to make games but once one was made, good-bye program if you were caught playing it. I also had no computer at home, as of yet, so I couldn't play it there either.

This problem was quickly remedied. An alternate program was developed so that should a teacher walk in while I was blasting away at alien blotches I would simply press a button and immediately a German quiz would appear upon the screen. My quiet diversions were quite successful, and I was soon spending my studyhalls going for a new high score. But, alas, this couldn't last forever, as I soon found out. I was sitting with hands flying over my control panel and aliens disintegrating all around when suddenly in walked a teacher. I quickly hit the escape key and immediately my lifesaving German quiz appeared on the screen. Quietly the teacher surveyed each student's work. When he got to my computer he seemed overly impressed by what he saw and asked if he could try. What can you say to a teacher "No just leave it alone!"? So, taking my silence as agreement, he

punched in the answer to the question. A surprised man was he when he soon found himself in the heat of battle with dangerous enemies from outer space. Needless to say that was the end of my first program. But it had served its purpose; it began my wonderous and tireless journey on the road to computing.

I decided that if I were going to get really serious about programming I would need a computer of my own. I acquired a second-hand Vic-20 with a cassette drive for fifty dollars. Soon I was spending most of my free time making various programs. I quickly discovered there isn't much that can be done with the unexpanded Vic. The dreaded "out of memory" error kept showing up. So I began my search for a better and more powerful computer.

Traveling to various stores throughout my area, I discovered many promising prospects. I also discovered that many people really don't know what they're talking about when it comes to computers, especially the people who are trying to sell them. Basically I knew what I wanted. I wanted an expandable computer with at least 64k, a disk drive (anyone who's spent hours just loading a program with a tape drive understands the need for the disk drive), and I also wanted a printer. The choice of a computer was a fairly easy one. I chose the Commodore 64 accompanied by a single floppy disk drive. But choosing the printer was an entirely different matter.

First I tried to decide exactly what I wanted to use the printer for. Was I going to just list out programs or did I want to get into word processing (something I hadn't really tried at that time)? I decided that since I was in my last year in high school my best bet would be to gear my printer towards word processing. But what did I want my final printed copy to look like? I had three choices: 1) a dot matrix printer which is very fast but the print is made of tiny little dots and looks rather unofficial. 2) a jet printer, a printer which burns the characters onto special paper with tiny lasers. The paper for these printers is costly and usually not readily

available. 3) a letter quality printer which has wheels called daisy wheels which spin around while a hammer hits it making the character appear upon the paper. The last type, although slow, is the one I finally chose, sacrificing speed for typewriter-like quality print. I bought the Comrex ComRiter II. The fact that it took the salesperson five minutes to figure out how to turn it on didn't discourage me in the least.

Now I had my computer system and not much to use it for. I didn't want to buy immediately a word processing program which can cost anywhere from $50 to $200 for an extremely powerful one. Who would after spending the money for a complete computer system? Here's where my limited programming knowledge came into play. I started to write my own word processing program.

If this has started to make computers sound fun and easy all the time, they aren't. After finally creating a somewhat workable word processing program, I made the small mistake of forgetting to save the program before turning the computer off. Needless to say, down the drain went months of work; I ultimately had to start over from scratch. But I never finished my second attempt, my parents bought me a word processing program for Christmas (I think my dad was tiring of the effort I was putting into making my own).

And thus the world of word processing was opened to me, and I haven't looked back since. The ease with which these programs work never ceases to amaze me. They can do anything a typewriter can do and more. They can make form letters with variable names and addreses, can search out and replace misspelled words and sentences and much more. But the biggest advantage of America's newfound toy is the ease with which typed copy can be constructed and edited.

With word processing, hours of valuable time and effort are saved. I used to spend time making rough drafts and laboriously making corrections here and there; but now, although I still need to mentally go over such steps as outlining my

writing, I can begin directly at the keyboard and immediately start to produce what ultimately becomes the finished product. All the steps of writing can be done with one copy. Outline, rough draft, and finished product are all basically done at the same time. Not only is this convenient as far as time is concerned, but it also saves considerably on arm fatigue.

Learning word processing is not always as easy as many people make it out to be. Different programs are sure to suit different people. I prefer to use either Apple Writer or Wordpro 3+. I feel most comfortable with Wordpro 3+ because it's the one I own and use most often. Many other programs which I've tried seem to be somewhat ludicrous especially when it takes three or more keystrokes to enable such functions as underlining. The hard part about learning to use word processing is with the editing and the incorporation of special functions into your writing.

Typing in the material to be printed is usually very easy because most programs start directly from a display screen on which you can begin immediately to type. But try to start editing, and you run into troubles very quickly. Not only are some of the codes for things like underlining and subscripts often difficult to remember, but usually if you press the wrong keys unexpected things begin to happen. I found this out one day in the middle of composing a ten page paper for a course in Classics. I was trying to get the printer to underline my book titles for me when by accident I pushed the return key when I should have pressed the restore key. Suddenly my disk drive started whirring and my term paper was gone. All five pages which I had already typed in were entirely lost.

Another thing which is often difficult to master at first is getting your printer to do what you ask the word processor to have it do. Printer codes are in the standard ASC II code and are usually not easily understood. I used the old trial and error method to discover how to use things like subscripts and superscripts. When you first start using word processing, believe me, you'll go through a lot of

paper. In the beginning, printed copies rarely, if ever, come out perfect the first time around.

If learning word processing sounds difficult at times, it's nothing compared to teaching it. I found this out while teaching a Journalism class how to use word processing. Although I was surprised at how easily most of the students picked it up, there were a few who I thought would never learn. To make matters worse, there were those embarrassing moments while trying to show a student how to do something that the computer would decide it was time for a nap and wouldn't respond correctly. I also was trying to teach these students with the Apple Writer, a program not so familiar to me, at that time. But eventually even those who were having troubles with word processing managed to master it enough to produce relatively good copy of their writing.

Word processing has definitely had a strong impact upon my writing. I used to look upon writing compositions and essays with a feeling close to dread; now I relish the thought. Each writing seems like a journey in itself, and the process by which the final copy is achieved is much easier. Before word processing, I would be reluctant to proofread my work for fear of finding too many mistakes and then being forced to rewrite it. Now I enjoy proofreading and the quality of my work definitely benefits from it. My spelling, although still atrocious, is no longer a problem because I have a program which checks every word in my writing against a dictionary and then tells me which words I may have spelled incorrectly. I find myself writing more conscientiously, concerned with quality rather than technicality. Writing, whether it be reports or articles for the school paper, is quickly becoming an enjoyable part of my life.